

July 26, 1999

Volume 16, Number 30

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*Eric Schmidt, Director of Information Services, Bricker & Eckler LLP
on switching to Microsoft® Windows NT® Server 4.0 from Novell NetWare*

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THIS WEEK
ONLINE

Gigabit speeds. Our story a few weeks back about Gigabit Ethernet chokepoints continues to draw comments. Last week, one Fusion user did some testing of his own, using NT clients and servers and Nortel Accelar 1200 and BayStack 450 switches. See his test numbers, and join in the discussion. **DocFinder: 3947**

Boom! A user needs help figuring out where packet collisions are occurring on his network. They always seem to peak around noon and 4 p.m., but his current LAN analyzer isn't telling him where. Suggestions? **DocFinder: 3948**

The name game. By the time you read this, it'll be too late to enter our Great Server Name Bakeoff. But you can still see what wild 'n' wacky things some people have named their servers. We'll announce the winner of the Dell server next week. **DocFinder: 3732**

Convergence. Everybody's talking about it, but who's really doing it? What do you think about the movement toward a single network for both voice and data? And if you've started heading that way, what have your experiences been and what would you most like to see from vendors? Discuss it in our convergence forum. **DocFinder: 3846**

Volunteer. Your skills are valuable. And there are volunteer and non-profit groups that would love your help. We want to help match you up. If you're willing to donate some of your time and skills, we'll try to find a group that would love a helping hand with its networks. We're starting our volunteer matching in the Framingham, Mass., area (where our main offices are), but we hope to expand across the country. Complete our online skills form if you're interested. **DocFinder: 3923**

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NetworkWorld

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- What you make: The 1999 Network World Salary Survey
- Your life in 5
- What's on your mind

... and more **Page 37.**

Although he knew his current position was,
to say the least, compromising,
Oscar's urge to dig deeper was too strong to resist.



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News

Carriers to debut innovative IP services

Future phone services will include IP Centrex, customized bandwidth provisioning and unified messaging.

BY TIM GREENE

Over the next few months, IP-based carriers will start introducing innovative new voice and data services, and will give customers extraordinary control over the services they buy.

Starting with rudimentary voice over IP, the carriers will then offer advanced capabilities, such as Centrex, and gradually develop more complex features, such as a combination of voice, e-mail and fax messaging.

In conjunction with customer devices that are under development, carriers could develop advanced services such as Dolby stereo audio-conferencing, desktop voice and data conferencing, and phones that integrate with Web browsers, says Ike Elliott, vice president of softswitch-enabled services at Level 3 Communications. "There will not be limits anymore," he says.

Underlying these innovations is a switching architecture based on devices known as softswitches, which are workstations that control calls on IP networks much like circuit switches do in traditional circuit-switched voice networks. These flexible devices support the rapid development

of the application software that defines the new services.

Several developments last week indicate that IP carrier networks are coming of age:

- AG Communications introduced iMerge, hardware and software that translate all familiar voice-call features of Centrex — such as three-digit dialing, conference calling and voice mail — so they can be delivered over IP networks.

- Frontier Communications committed to using a program-mable softswitch architecture that supports new services, including customer self-provisioning of bandwidth on demand.

- More than 50 vendors met for the first time as the International Softswitch Consortium to speed development of new carrier services and promote interoperability of devices within and among soft-switch networks.

- Start-up ipVerse pledged next month to detail software that will enable the rapid development of new IP

Future phone services

New switching technology will enable services such as "follow me" phone numbers that connect you to voice and data networks.

1. Customer connected to corporate LAN gets voice, e-mail and fax messages at the desktop.
2. Using special portable hardware, the customer gets those same services when traveling.
3. When the customer reaches a destination, the device is plugged into a local carrier connection and the service is extended to that location.



carrier services.

Bringing Centrex services to IP networks is important because it will show customers that these new nets can reliably mimic traditional circuit-switched voice networks, analysts say.

"I look at IP Centrex as a feature you have to have to play in the market as a voice-over-IP service provider," says Christopher Nicoll, a senior research analyst at Current Analysis in Sterling, Va.

Once IP carriers prove themselves reliable with a familiar service like Centrex, customers will trust them with more

advanced services that are still under development, says Deb Mielke, principal with Treillage Network Strategies, a consultancy in McKinney, Texas.

Frontier is starting down that road. The local and long-distance carrier is building a fiber-based IP backbone network and says that later this year it will start rolling out voice-over-IP services.

By the middle of next year, the company will be letting customers provision bandwidth on demand that will be ready for use in 15 seconds.

For instance, customers who need an extra T-1 for a month-long project will be able to directly provision the bandwidth via a Web interface and then cancel it when the project is finished.

In the meantime, Frontier will also start offering a unified messaging service that blends features of voice networks and the Internet to give customers a single access point to voice mail, e-mail and faxes.

To speed the development

of such services, the International Softswitch Consortium plans to focus on interoperability among devices necessary for softswitch networks, Level 3's Elliott says. That, in turn, will speed development of the application software that controls services.

As part of that effort, ipVerse next month will introduce its call control and routing system, which tells softswitches how to handle each customer connection. For example, a service application could tell softswitches how to use resources in a carrier network to track down a customer who has bought a follow-me phone service.

Some of these applications will be written by customers, says Lew Bobbitt, vice president of marketing at Salix, a company that makes gateway switches that are part of a softswitch network architecture.

A large enterprise call center might write its own software to control how incoming calls are handled, for instance. That software would be used to tell the carrier network how to route calls, Bobbitt says. ■

Get more info online.

DocFinder: 3945

www.nwfusion.com

Bell tolls for High-Speed Token Ring Alliance

BY MARC SONGINI

Roughly two years after it started, the High-Speed Token Ring Alliance (HSTRA) has accomplished its goals of establishing a specification and seeing some members ship 100M bit/sec token-ring products.

The question is, does all of this activity matter? Has the HSTRA arrived just in time for its own funeral?

Founded to give token-ring customers an upgrade alternative to 100M bit/sec Ethernet,

the HSTRA's roster initially was a who's who of network players, including Cisco, 3Com, Texas Instruments, Compaq, Cabletron, Xylan, the former Bay Networks and IBM.

Now after two years, the membership list has been whittled down, by defections or acquisitions, to the three leading token-ring players: IBM, Madge and Olicom. According to International Data Corp., IBM has 49% of the token-ring adapter market, Madge has 24% and Olicom has 22%. Although Cisco offers

a form of 100M bit/sec and gigabit token ring, critics claim they are proprietary products and not authentic token ring.

In addition, only Olicom and Madge offer any gear other than 100M bit/sec token-ring adapters.

Olicom, for example, offers network interface cards for servers and 100M bit/sec token-ring switching blades for its Crossfire 8600 switches. IBM planned to roll out switches that support the HSTR specification, but now See **HSTR**, page 92

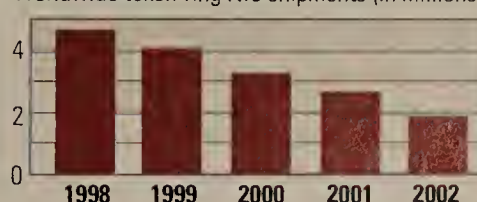
Jumping ship

The number of HSTRA members has dwindled since the group was started two years ago. The decline is partly related to falling interest in token-ring equipment and technology.

Worldwide token-ring hub port shipments (in millions)



Worldwide token-ring NIC shipments (in millions)



SOURCE: IDC, FRAMINGHAM, MASS

High-Speed Token Ring Alliance members:

1997 (year founded)

Bay Networks	IBM
(now Nortel)	Madge
3Com	Novacom
Cabletron	Olicom
Cisco	Texas Instruments
Compaq	Xylan

1999

IBM	Olicom
Madge	

NEWS BRIEFS, JULY 26, 1999

There's still time to dust off the résumé

The IT job market continues to belong to the sellers, according to a new report from Meta Group, a consultancy in Stamford, Conn. The report predicts that some 400,000 IT jobs will go begging this year and that demand for IT services is growing 25% annually. Slightly more than half of the 150 organizations polled reported that their IT staffs had expanded during the past year. . . . Isn't it nice to be wanted?

Lotus polishes up a Mac client

An apple a day keeps the cross-platform blues away for Lotus, which said last week it would release a Notes 5.0 client for the Macintosh later this summer. Lotus is filling out its product line for the Notes client even as the company plots strategy to eventually make the Web browser the universal client for its Domino server.

The Macintosh client will require a PowerPC or G3-based platform, Macintosh Operating System 7.6.1 or later, 32M bytes of RAM and 100M bytes of hard-disk space. The Notes for Messaging client is priced at \$55, while Notes for Collaboration costs \$69.

Unruly flier finds himself a jailbird

Hey, the guy's lucky they didn't hand him a parachute and boot him out a cargo bay. Instead, 28-year-old British oil worker Neil Whitehouse was sentenced to a year in jail last week for refusing to switch off his mobile telephone during a flight from Britain to Spain. Unlike the U.S. and



Germany, for example, Britain has yet to outlaw the practice of yakking on the cell while airborne. However, Whitehouse was bagged for violating a 1995 statute making it a criminal offense to act in a manner likely to endanger an aircraft.

Now, if we can only do something about cell phones in restaurants.

NT Service Pack 6 hits beta

Microsoft was busy last week doing some housecleaning. The company released a beta of Service Pack 6 for Windows NT 4.0. The service pack includes an updated set of fixes for Windows NT Server 4.0, standard and Enterprise Edition, as well as Windows NT

Workstation 4.0. The service pack, which is not a required upgrade, is available at technical beta sites for premier customers.

Also, Microsoft changed its end-user licensing agreement for its SNA Server to eliminate the single-user restriction for 3270 and 5250 clients. The move was made to facilitate Web browser connectivity to AS/400 and mainframe systems.

The company also released Vizact 2000, the newest member of the Office family of products. Vizact lets users add interactivity, such as pop-up information windows, to Word documents.

Ballmer bombast on Linux

In the company's most recent attempt to persuade the press and analysts that the sky will soon fall in Redmond, Wash., Microsoft officials last week painted a bleak picture of powerful competitors and eroding revenue growth. Playing the lead role of Chicken Little was Microsoft President

Steve Ballmer, who wailed in particular about the threat posed by the increasingly popular Linux operating system.

"Linux is above all else a serious, albeit crazy, implementation of Unix on the Intel architecture," Ballmer says.

Would that be crazy like a fox, Steve, or just crazy?

"Hey, this site is great!"

An Israeli company has developed a new way for users to share information about a particular Web site with Post-It Note-like software.

User's tree of knowledge, or uTok, uses proprietary software that tracks which URL a browser is visiting, then displays any relevant notes pertaining to the given page. Users can leave notes for the general public, a group or a specific person. The notes are "Site Polite," meaning they are not displayed in line with the HTML page, but instead in a separate window running alongside the browser. Notes are stored on a central server farm in New York. Posted items can be given a thumbs up or down by fellow users, with enough no votes resulting in the message being removed.

Only uTok-enabled users can view the notes. The free client software is currently in beta and can be downloaded at www.utok.com.



Microsoft's Ballmer says it's time to take the threat of Linux competition seriously.

New Compaq CEO draws mixed reviews

BY DENI CONNOR

Compaq's decision to turn in-house for a CEO is drawing praise from some and raised eyebrows from others who question whether this new skipper can right the computer giant's listing ship.

After reportedly failing in attempts to attract a high-profile outsider, Compaq last week named Michael Capellas president and CEO. Capellas, a relative unknown, came to Compaq as chief information officer 11 months ago from Oracle and has served recently as acting chief operating officer.

"Capellas seems like a very qualified CIO," says Louis Mazzucchelli, an analyst with Gerard, Klaver and Mattison in New York. "We'll see if he can rise to the challenge of being a CEO."

"There are a bunch of open issues. Can he effectively manage a large sales force and multiple direct distribution channels? Can he develop and nurture a large corporate culture? Can he set corporate strategy and corporate positioning and drive implementation of those things?" Mazzucchelli asks. "There's nothing in Capellas' résumé that screams that he can."

Although lacking critical experience as a CEO, Capellas, 44, brings to Compaq a wealth

of experience in electronic commerce, supply chain management and IT from his days at Oracle, SAP America and Schlumberger. That type of background is critical to turning Compaq around, says one Compaq customer.

"Naming Capellas president and CEO is a solid and welcome move as he comes from an enterprise background and his experience lies there rather than in the commodity PC market," says Hal Kuff, manager of systems and networking at TESSCO, a distributor of communications products in Hunt Valley, Md. "Any lack of history as a CEO is not a concern to the user community."

At a press conference held in New York, Compaq Chairman Ben Rosen said Capellas was the only candidate to whom the board made an offer. However, several high-profile candidates, including Oracle President Ray Lane, had reportedly removed themselves from consideration.

Capellas said he took the job with no guarantees or expectations regarding Rosen's continued involvement in decision making. The Rosen-led Office of the Chief Executive, which has been running the company since its ouster of former CEO Eckhard Pfeiffer, will be disbanded immediately.

Capellas is extremely capable and was instrumental in realigning the company into three business units, according to Rosen. "He has been doing the job for almost two months now," he adds.

Speaking confidently and passionately, Capellas said he will present a further reorganization plan to the company on Aug. 15, but he declined to provide details. Compaq will reduce its head count by 1,800 as part the original Digital integration plan.

Capellas' selection may be the most high-profile CEO appointment without previous chief executive experience since Novell tapped Sun chief technologist Eric Schmidt in 1997. ▀

Be a

Net Know-It-All

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2467 in the DocFinder box.

This week's question:

Which state is home to the headquarters of network companies ADC Kentrox, Tektronix, Sequent and WebTrends?

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Sprint joins the Web-based frame management game

BY DAVID ROHDE

DALLAS — Sprint last week unveiled an enhanced frame relay service that provides a browser-based view into the path of users' packets, as well as reports on the carrier's network performance.

The introduction of the service continues the trend of large carriers adding performance-measurement tools to their frame relay and ATM services — for an additional fee beyond data transport charges.

Sprint's service, called Web-based Network Manager, involves the installation of an Analysis Service Element (ASE) — basically a souped-up DSU/CSU — at each customer site.

The ASEs, from Visual Networks, continuously capture and feed information about packet throughput to a large database at a Sprint network management center. The database, housed on a server known as the Visual Networks Performance Archive Manager (PAM), is partitioned enterprise by enterprise. Web-based access to the server is provided to network administrators via IDs, passwords and firewalls.

PAM provides up to 60 near-real-time and historical reports, including a customized comparison against Sprint's standard frame relay service-level agreements. One report even measures the comparative performance of frame relay packets encapsulating datagrams from different native protocols, such as IP, IPX and SNA.

Sprint has been reselling ASEs and PAM directly to enterprises since 1996, and it has a longer relationship with Visual than any other major carrier. But in the three years since Sprint's reselling began, AT&T and MCI WorldCom have not only signed agreements with Visual, but have incorporated the equipment into managed frame relay services in which users do not have to maintain the database server.

AT&T's Visual-based service with Web-based access, called Frame Relay Plus, was introduced last year. MCI WorldCom rolled out its product, MCI WorldCom Circuit View, earlier this year.

Sprint is offering Web-based

Network Manager in two flavors. The first, requiring no client software beyond a browser, costs \$38 per month, per site in addition to frame relay charges and ASE lease charges. The second, requiring additional client software from Visual, gives on-site network

managers additional datascopes capabilities to determine on the fly why traffic spikes occur. That service costs \$68 per month, per site.

MCI WorldCom's pricing is similar for Circuit View, while AT&T charges a little more for Frame Relay Plus (see graphic).

AT&T claims its service is unique because it not only measures performance but also aids customer service by helping technicians fix problems. But Peggy Arnone, Sprint frame relay product manager, last week said Sprint will provide the same network views to

account teams.

One unique feature AT&T offers is a Visual-based option for ATM performance measurement. Mark Fernandes, senior network analyst at BancBoston Robertson Stephens in San Francisco, anticipates that Sprint and MCI WorldCom will eventually follow AT&T's lead.

Rockville, Md.-based Visual's stock dipped during the spring as questions arose about how many users would invest in such enhancements, and whether all carriers would incorporate the boxes into services paid for monthly. However, Visual's stock has since risen from a low of around \$26 to about \$44 per share as the new MCI WorldCom and Sprint deals came online, Fernandes says. ■

Paying for performance reporting

List prices for the top three carriers' enhanced frame relay network-management services:

Carrier	Name of service	Price per site, per month for basic service option	Price per site, per month for additional reports and configuration options
AT&T	Frame Relay Plus	\$50	\$85
MCI WorldCom	MCI WorldCom Circuit View	\$38	\$68
Sprint	Web-based Network Manager	\$38	\$68

Note: Frame relay port, circuit and access charges are additional. For each carrier, prices may vary depending on required equipment, term contracts and other factors.

Sony looks to e-comm and shakes up the channel

BY ELLEN MESSMER

Electronic commerce has been known to shake up relations between manufacturers and their distributors, and there is no better current example than what's happening with Sony Electronics.

This \$10 billion division of Sony Corp. is quietly devising an e-commerce strategy to be unveiled next month in which the consumer electronics giant will sell its TV and audio/video equipment directly to the public over the Web.

In the meantime, Sony's longtime distributors — even Circuit City, which opened its first electronic storefront last week — have been told not to sell Sony gear until given permission. Sony is the largest supplier to Circuit City's brick-and-mortar stores.

Crutchfield, the one Sony distributor that was authorized to sell online and enjoyed that privilege for three years, just had that permission revoked. Sony is telling distributors the ban may be lifted next month when its e-commerce plan is ready. But the company will only authorize retailers to sell online if they subscribe to the rules Sony is now drawing up.

As they wait for Sony to give

them their e-commerce marching orders, online retailers such as Circuit City, Crutchfield and J&R Music World are side-stepping the Web sales ban in clever ways. Some won't take a Web form credit card order for Sony merchandise, but are advertising the products in Web photos and asking buyers to call a toll-free number to place an order. Or fax. Or e-mail.

"This is just temporary," says David Dierolf, vice president of IT at Crutchfield, of the restriction.

But is Sony going to abide by middlemen, or try to cut them out of the Web picture and keep the direct channel for itself? Sony Electronics spokesman Brain Levine says the company's partners will ultimately be allowed to sell Sony gear online, but only if they pass a few tests.

"They're going to have to meet certain requirements, such as satisfying inventory needs, and meeting service and educational requirements," Levine says. "We want to make sure the public has a good buying experience."

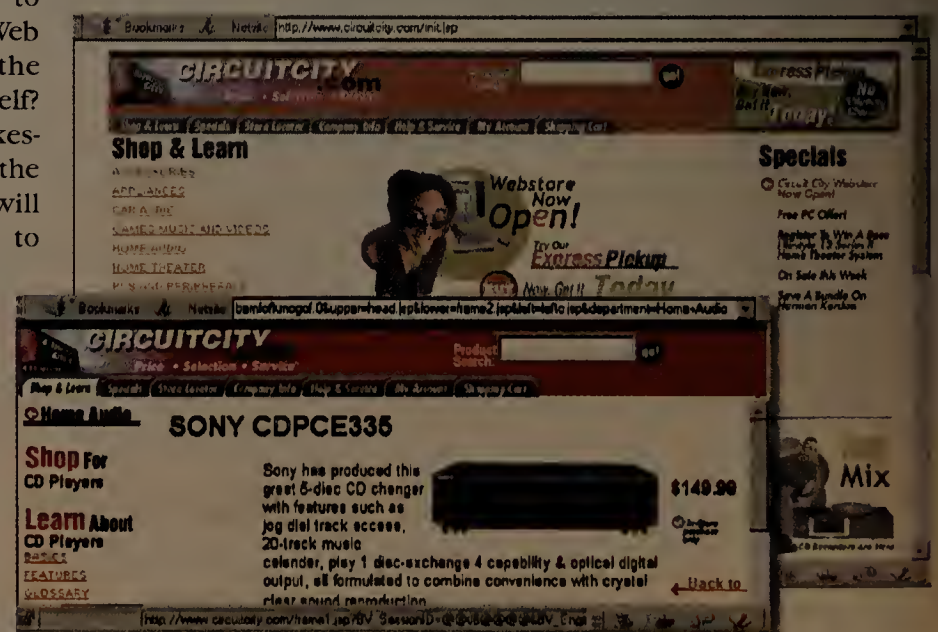
Sony has little experience in direct sales. It operates three Sony-owned stores in Chicago, San Francisco and New York, but "the purpose of the stores is not to generate sales," Levine says. "It's to show our full portfolio in the best light because shelf space in retail stores is tight."

Sony does have a Web site called Viao Direct where it sells computers and peripherals directly to consumers. But next month's anticipated e-commerce plan will have a tremendous impact on distributors

where the Sony brand is critical to buyers.

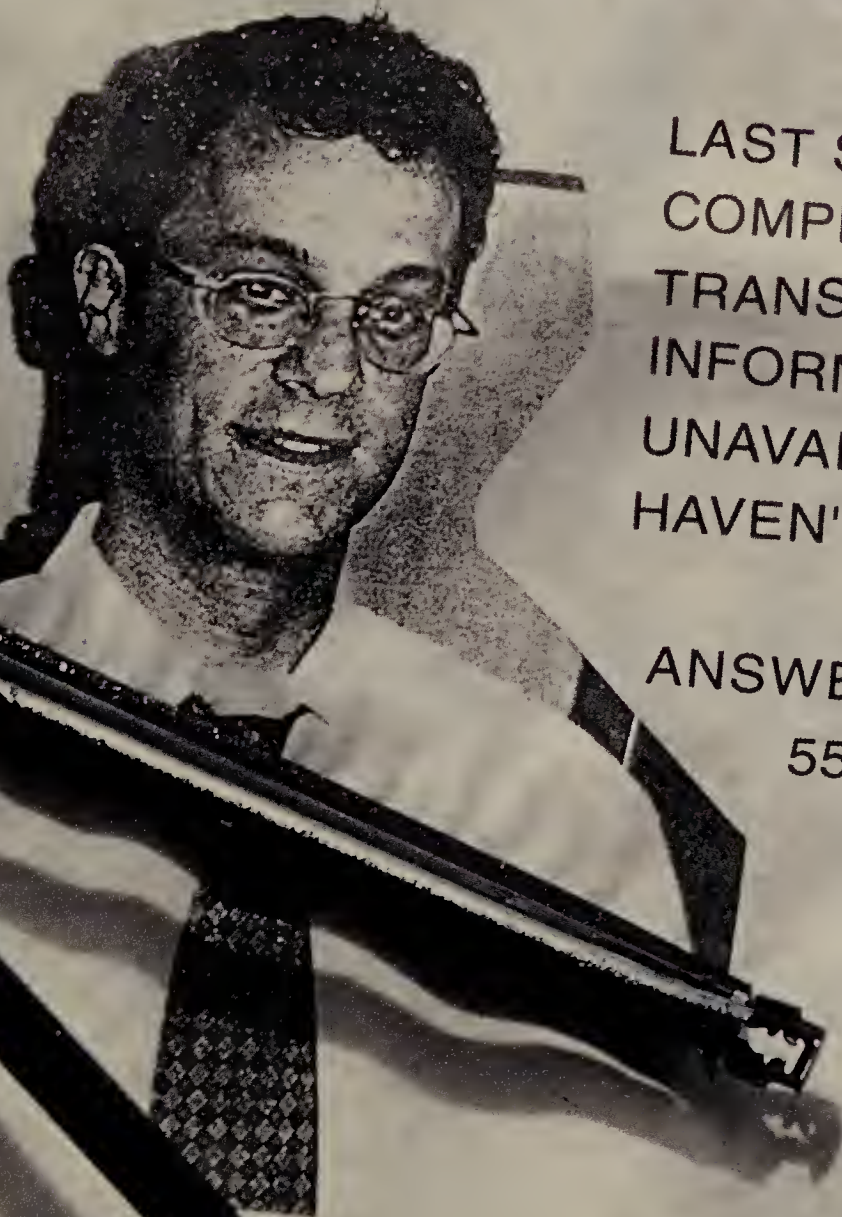
Last week, Circuit City was busy pushing out press releases about its new online stores and how it is using the Broad-Vision electronic catalog — which typically costs \$1 million and up — as the technical platform for its new online effort.

Circuit City refused to discuss how the Sony ban has impacted its e-commerce plans, but spokesman Morgan Stewart says the retailer has to abide by whatever Sony says. Yet a quick search on www.circuitcity.com shows plenty of Sony TVs and other gear for sale by credit card. ■



Circuit City opened its first Web store this week, but Sony Electronics told the distributor not to sell Sony TV and audio/video equipment online.

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New HP CEO brings powerhouse rep

Former Lucent executive Carly Fiorina to take control at computer giant.

BY DENI CONNOR

Even Oprah Winfrey, at No. 2, takes a back seat to Carly Fiorina atop *Fortune* magazine's list of the 50 most powerful women in American business.

Little wonder: Last week Fiorina was named CEO at Hewlett-Packard, making her the head of the largest public corporation ever run by a female executive.

While Fiorina, 44, was not one of the more high-profile candidates for HP's top job, her talents are the stuff of a top-notch CEO, especially for an established company looking for a fresh push into electronic commerce, experts say.

HP calls this market segment e-services, a program designed to make its products and services available to customers over the Internet and to allow customers to use the Internet to improve their businesses.

"The message that comes with Fiorina is that HP is serious about giving itself a new look," says Kelly Spang, an analyst with Technology Business Research in Hampton, N.H. "Fiorina's background in man-

agement, business and technology gives her the ability to bring out-of-box thinking and creative problem-solving to the company."

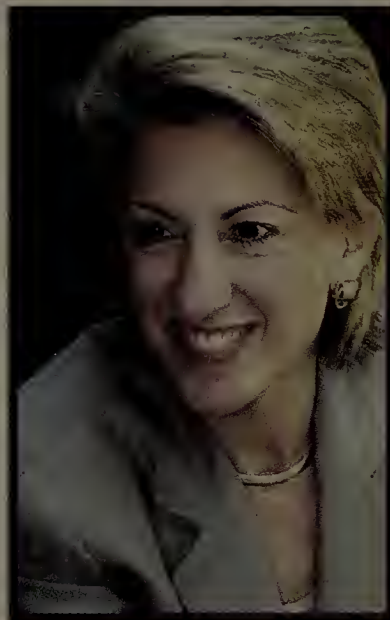
In doing so, however, the former head of Lucent's Global Service Provider Business will not want to disrupt the 60-year-old company's consensus-based "HP Way," Spang suggests. But the firm will need to get products to market faster.

"The 'HP Way' has evolved over time — treating customers, employees and suppliers with respect and integrity — it's a core that doesn't go away," Spang says. "Fiorina seems intent on maintaining the assets of the 'HP Way' while really lighting a fire under HP to get the company to move quickly with e-services."

Fiorina took a circuitous route to the top of HP. A student of medieval history and a law-school dropout, Fiorina hopped from secretarial to teaching jobs before taking a job in sales at AT&T, where she started in 1980 selling telephone services to the federal government and was regularly promoted.

When AT&T spun off Lucent

Technologies in 1995, Fiorina managed the transition and the then-record \$3 billion initial public offering in 1996. Fiorina was so successful in this job



New HP CEO Carly Fiorina is the head of the largest public corporation run by a female exec.

and several others that she was tapped as CEO of Lucent's \$20 billion Global Service Provider Business. Today, this division accounts for over 60% of Lucent's revenue.

Fiorina was born into a left brain/right brain family, the

daughter of a law professor father and an artist mother in Austin, Texas. She traveled the world with her family and attended five high schools before settling down in the United States. She has a B.A. from Stanford University, an M.S. from MIT's Sloan School of Management and an M.B.A. in marketing from the Robert H. Smith School of Business.

Fiorina lives with her husband, Frank, a retired Lucent executive, in New Jersey.

While the press makes much of her gender, Fiorina is accustomed to working with high-profile women at Lucent and will be surrounded by them at HP. At Lucent, former peers are Pat Russo and Kathy Fitzgerald, both vice presidents.

And at HP, three women hold top offices in the executive suite: Carolyn Ticknor, CEO of the printer division; Susan Bowick, a human resources executive; and Ann Livermore, head of HP's Enterprise Computing Division.

Livermore, who was considered the top inside candidate for the CEO job, is expected to stay on in her current position. ■

HP readies two more portals for supply-chain information

BY ELLEN MESSMER

NEW YORK — Hewlett-Packard last week nailed a few more boards into its e-services platform strategy by announcing plans to build two Internet portals where trading partners can meet online to share critical business data.

The first portal is being co-developed with i2 Technologies, the company that developed the supply-chain management application called Rhythm.

The plan calls for HP to host the Rhythm application so electronics distributors and other industries can store and retrieve supply-chain information from the applica-



Roberto Medrano, general manager of Hewlett-Packard's e-services division, says "apps on tap" will be up and running in the fall.

tion. These distributors would pay a transaction fee or

monthly rental charge to HP, rather than purchase a site license.

This concept is also being called "apps on tap," and HP's interest in building these applications with partners such as i2 Technologies is a key part of the HP e-services strategy.

Roberto Medrano, general manager of HP's e-services division, says the supply-chain portal will be up and running in late fall, and HP will be managing the network and data flows in the supply chain.

Second portal on the way

The second HP e-services portal is for document and CAD/CAM file sharing by

manufacturers such as auto-makers and their suppliers. The second portal, called e-Vis.com, is being constructed by Engineering Animation, an Ames, Iowa, engineering firm.

"The rise of apps on tap is a new view of computing service," says Bill Russell, CEO and executive vice president of HP Enterprise Computing, adding that other HP portal ventures include one under development with Ariba for business-to-business catalog buying.

Russell says HP expects to earn almost nothing this year in its portal ventures, but the company is counting on portal revenue in the years ahead. ■

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CA to add smarts to net management

Neural network agents to detect network patterns, predict failures and issue alerts.

BY JEFF CARUSO

NEW ORLEANS — Using its systems management background, Computer Associates in the coming months will try to beef up its network management software with neural network technology and a variety of new control functions.

CA will point its neural network agents, called Neugents, at network data. Neugents can look at any kind of data over time and attempt to glean patterns and predict future behavior, according to CA. In a network setting, a Neugent would be able to tell network managers when a router was about to fail, for instance.

Other enhancements on tap include a module for governing access to network resources and virtual LANs, and another for helping to determine the root causes of network failures.

These functions will be offered as add-on modules for NetworkIT Pro, CA's stand-alone network management software, and for Unicenter, the company's unified systems and network management suite.

A Neugent would run at a network management station, which collects data from Remote Monitoring and SNMP agents around a network. Examining CPU utilization, throughput and other metrics collected from the agents, the Neugent would create a model of typical behavior for a network device and generate an alert if the device started behaving abnormally.

Neugents are what will take CA's product beyond the reac-



Neugents will help users more proactively manage their nets, Gupta says.

tive management it performs today, says Yogesh Gupta, senior vice president of product strategy at CA. "With Neugents, the system truly becomes preventative," he says.

Neugents will be able to watch only a limited number of devices, however. CA says it doesn't

know how many devices a Neugent can handle, but the company demonstrated the software monitoring eight devices at the CA-World trade show in New Orleans last week.

Another Neugent limitation

might appear if a user's network changes rapidly, says John McConnell, president of McConnell Associates in Boulder, Colo. "If your environment is too dynamic, then once a Neugent learns about it, [the environment] has already changed," he says.

"Neugents would be good for trend analysis," says Ron Seggio, divisional vice president of information services at PaineWebber.

At this point, Neugents remain largely untested, as they are only available for monitoring server performance. Network Neugents will appear later this year.

In the next couple of months, CA plans to release

NetworkIT Pro 2.0, which adds support for Unix and ships with CA's Ingres database so users don't have to purchase a separate SQL database.

Soon after, CA will ship the network access policy option, which will let network executives set policies about who will have access to which VLAN. The software will work with Cisco Catalyst switches and 3Com switches, says Imran Anwar, product marketing manager at CA.

The root-cause analysis function will follow, probably as an option, he says. The software will use Neugent technology and knowledge management tools to analyze data and figure out from where a network problem might be originating.

Also on tap are enhancements to the frame relay service option for managing networks that are running voice and data.

CA: www.cai.com

Neugents: The thinking man's agent

CA says Neugents are smarter than Einstein, but users need proof.

BY JEFF CARUSO

NEW ORLEANS — Neugents are striking a chord with Computer Associates software users, though the technology is still largely unproven in business scenarios.

At the CA-World user conference last week, the company talked freely about the promised benefits of its neural network software agents, called Neugents. But at this point, many of CA's Neugents are only in beta testing.

Neugents will pervade the next versions of CA's core products — namely Unicenter systems management software and its Jasmine object-oriented database. The value of Neugents is that they look for patterns in data and can extrapolate from the patterns to predict future events, according to CA. Neugents can look at up to 1,200 variables and make sense of them all.

Business data is one area in which CA is pushing the new technology. "You could get to

know the customer a little bit better," says Margo Weeks, vice president of IT for Radio Shack Canada. For example, by looking at customers' buying patterns, a Neugent might be able to predict which customers are more inclined

to purchase extended warranties, she says.

Another CA user considering Neugents is The Sharper Image. Data mining is critical to the company's success, especially as it increases online shopping efforts, says Meredith Medland, director of the company's Internet division.

"The future of e-commerce is data mining, whether that's [managed by] Neugents or anything else," she says.

In data mining or other large-scale applications, the user has to know which variables to tell a Neugent to watch. In many cases, CA will customize the Neugent technology through its professional services division.

The first Neugent, announced in April 1998 and shipped in December, predicts

performance for Windows NT servers. One upcoming Neugent will look at network data to predict when routers will fail (see story, above).

Ron Seggio, divisional vice president of information services at PaineWebber, is impressed with Neugents for looking at network and systems trends. But Seggio wonders how easy it would be to migrate from the current Unicenter version to one using Neugents.

Meanwhile, CA is aggressively marketing Neugents with language that can only be called hyperbolic. "One Neugent is smarter than a million Albert Einsteins," one of its commercials says.

"When a Neugent comes up with the Theory of Relativity, I'll be impressed," says John McConnell, president of McConnell Associates in Boulder, Colo. But McConnell adds that he will reserve judgment about Neugents until he has a chance to talk to early users. CA says early users aren't willing to talk publicly about the technology yet because they see it as experimental. ▣

More breaking news

Network World Fusion has more news than ever — about 20 original stories every day! Here are just a few of the highlights:

Network Associates loses nearly \$200 million in second quarter:

The antivirus company's sales in the most recent quarter plunged to some \$25 million, roughly one-tenth of what they were in the previous year's same quarter. **DocFinder: 3953**

Microsoft launches MSN Instant Messaging Service:

Copying its rival America Online, Microsoft is giving its MSN customers instant messaging. Microsoft, thinking it was making the service better, made its messaging compatible with AOL's. AOL's response? Sending those e-mails to us is the same thing as hacking. **DocFinder: 3950**

FCC: Cable operators shouldn't have to open up their networks:

The FCC seems to think that large cable operators, such as AT&T, should not have to give Internet competitors access to cable networks. The FCC says cable companies would not innovate if they had to share. **DocFinder: 3951**

Sun and Netscape claim their alliance is a huge success:

The name Netscape is no more. The alliance between Sun and Netscape, which is responsible for most Netscape software, will now give products the common brand name iPlanet. The two vendors also boast about new customer and product integration plans. **DocFinder: 3952**

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Domain name machinations promise users big payoffs

Lower prices and expanded services seen springing from Internet domain name registration competition.

BY CAROLYN
DUFFY MARSAN

As the government takes steps to bring competition to the registration of Internet names, network executives may start benefitting from lower prices, quicker response times and an explosion of new services that will simplify doing business online.

Indeed, just the threat of competition has already brought some of these benefits to the marketplace. Internet name registration fees, for example, have dropped from \$100 for a two-year registration to \$70. Most domain names are now functional within 24 hours. And Internet vendors are coupling registration services with e-mail, URL forwarding and Web hosting services.

But Internet vendors expect even better offerings as the number of registrars grows.

"What's really important about getting competition in the registration business is to get the service price-competitive," says Ed Hansen, public

relations manager at MindSpring, an Atlanta-based ISP that is one of the largest processors of name registrations. "Customers also should be able to

tion," predicts Richard Foreman, CEO of Register.com, a New York registrar in business since June.

Another advantage of com-

Yankee Group. "That kind of end-to-end capability is going to be an advantage from the provider side as well as the customer side."

• The House of Representatives' Commerce Committee held hearings on privatization of the domain name system: 13 experts from government, industry and academia testified.

As the debate rages on in Washington, D.C., about how best to open up the domain name registration business, benefits for corporate end users have been largely overlooked.

Even more significant than the price drops is the anticipated introduction of new and improved registration services. NSI, for example, today is announcing an online directory service that will help businesses that choose its registration services be located on the Web by potential customers. NSI already offers e-mail, Web site forwarding and billboard advertising.

"The new competitive environment makes everyone more attuned to what they can do better," says NSI spokesman Brian O'Shaughnessy.

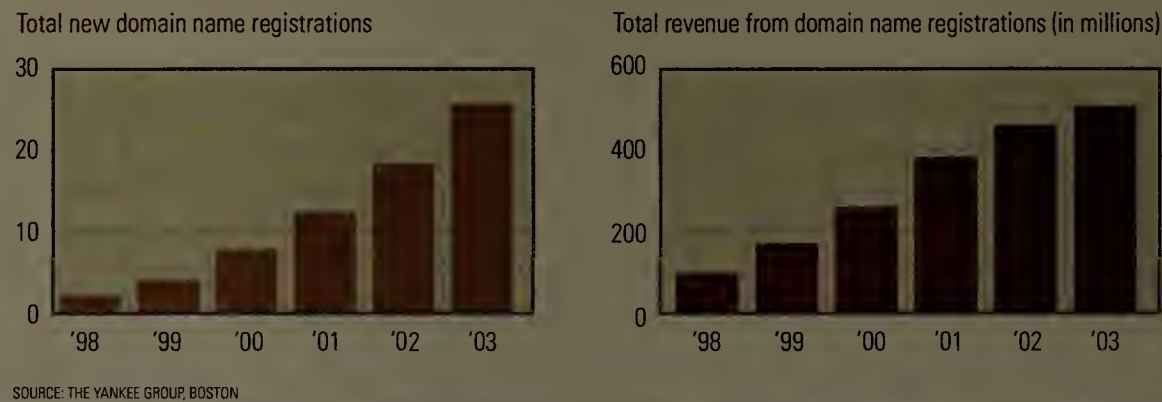
Registrars will be competing on issues of speed, downtime and customer service. Register.com, for example, asserts that it has not experienced outages, unlike NSI. Register.com also claims its domain names can't be stolen or redirected, as is possible with NSI's baseline security.

Other new services being offered by Register.com include the ability to register names in all country codes simultaneously, and the option to withhold the name of the registering company for privacy purposes. "We can offer very discrete domain name registrations for companies that want to register in a hush-hush manner," Foreman says.

Another area in which improvement is needed is in the ability to transfer domain names from one organization or service provider to another. "Hopefully, competition will bring a way to provide a level of security as well as an ease in transferring domain names. Today, that's about as difficult as moving a house," says Serge Wilson, CEO of FreemERCHANT.com, a site that hosts more than 10,000 cyberstores. ■

Internet expansion

Analysts predict that the number of Internet addresses will skyrocket over the next few years, along with revenue from new address registrants.



expect what is promised — virtually immediate registration — and that doesn't happen all the time."

"Corporate end users will see more reliability, more security and a greater selection of services because of competi-

petition is one-stop shopping for Web site services. "Providers are going to be able to give end users address registration, Web hosting services, and long-distance and local services all in one shot," says Michele Pelino, a senior analyst at The

For the past seven years, companies requesting Internet names ending in .com, .net and .org had to go through a single registrar, Network Solutions, Inc. (NSI) of Herndon, Va. Under a contract with the U.S. government, NSI assigns new domain names, maintains a central database of assigned names and handles name-related disputes.

The Clinton administration targeted NSI's monopoly position in 1997, when the government announced plans to privatize the management of Internet domain name allocation. Last November, the Department of Commerce selected a nonprofit organization, the Internet Corporation for Assigned Names and Numbers (ICANN), to oversee the privatization process. So far, slow but steady progress has been made.

Developments last week included:

• The Commerce Department extended its trial of five new registrar companies until Aug. 6. Eleven other companies are developing interfaces to the central domain name database in preparation for offering registration services later this summer.

• ICANN withdrew its plan to add a \$1 fee to all domain name registrations. The group also agreed to hold its next board meeting in public.

Users welcome Novell's Single Sign-on

New application gives secure, NDS authenticated access to apps.

BY ROBIN
SCHREIER HOHMAN

PROVO, UTAH — Novell's new Single Sign-on application and tool kit promises to provide users with a simple, single and secure point of entry into applications as well as the network operating system.

Single Sign-on, announced last week, lets users log on once using a Novell Directory Services (NDS) password and gain access to various messaging, groupware, workflow and other secure applications throughout the network.

Single Sign-on consists of client and server software. The server piece resides on a NetWare 5 server running NDS. NDS requires NetWare 5, but later this year Novell will ship versions of NDS on NT and

NDS for Solaris that won't require NetWare 5 in the mix.

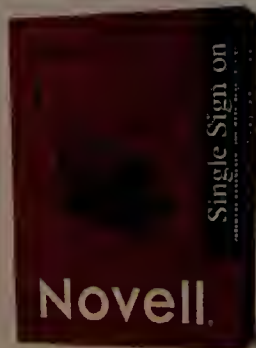
Currently, Single Sign-on supports Lotus Notes, PeopleSoft, Entrust and host emulation products from Wall Data and Attachmate. Host emulation products let users access mainframe resources from PCs.

Novell plans to introduce more out-of-the-box application support in the future, but right now users need to NDS-enable their own applications. The tool kit does that by providing APIs. "Ninety percent of our customers have home-grown apps within their envi-

ronment," says Paul Corriveau, product marketing manager for NDS. The tool kit will let users create secure hooks into NDS so the Single Sign-on model extends to other applications.

The tool kit doesn't require the applications to be modified; applications can be NDS-enabled by adding a tool kit-created file to the user's desktop. Single Sign-on sells for \$26 per user. The tool kit is available for free download at www.novell.com/products/ssso.

The APIs can be downloaded at www.developer.novell.com/ndk/sscomp.htm. ■



Single Sign-on will let users easily access multiple messaging or groupware apps.

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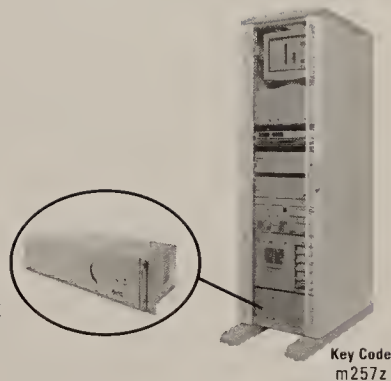
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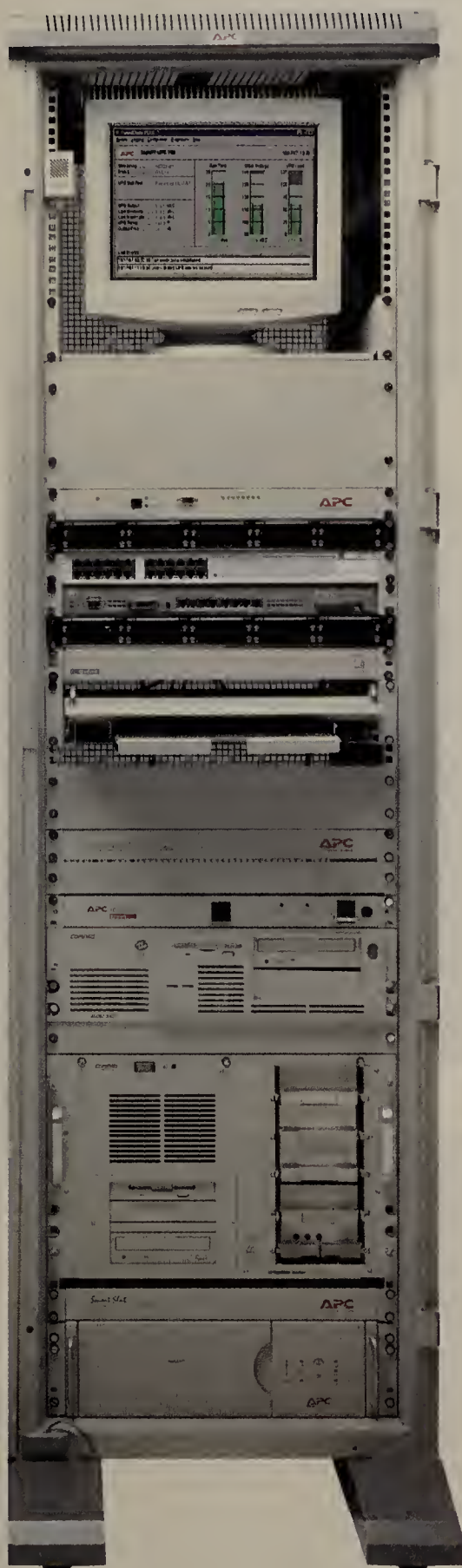
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Briefs

Digi International and **NTP Software** recently formed a partnership in which the firms will combine their tools to bolster management reporting for Microsoft's Windows NT Routing and Remote Access Services (RRAS). Digi provides routing and remote access adapter cards and concentrators for PC operating systems, while NTP's software automatically enforces remote access management policy. RRAS lets routing take place on Windows-based networks without the need for dedicated router hardware.

MTI Technology has unveiled an enhanced RAID subsystem with switched fabric support for storage-area networks. Dubbed the NorthStar series, the storage system employs MTI's Gladiator 6700 RAID subsystem and allows concurrent access to data by multiple host computers. The 6700 RAID subsystem can be expanded to hold three terabytes of data. NorthStar also features a graphics-based storage management package. The NorthStar series supports Hewlett-Packard HP-UX, IBM AIX, Microsoft Windows NT, Novell NetWare, SGI Irix and Sun Solaris operating systems. Pricing starts at \$129,000. MTI: www.mti.com

Wall Data recently announced the rollout of software that will let Citrix or Windows Terminal Server users access data on IBM mainframes and AS/400s or Hewlett-Packard and Unix servers. Rumba Office 2000 for Citrix and Windows Terminal Server will let customers set up and control client access from a central server without having to reset each desktop. Rumba Office 2000 is available now. Prices start at \$1,250.

Wall Data: www.walldata.com

Compaq aims high with small server

Company's two-node 'Toucan' cluster is an alternative to pricey enterprise clustering packages.

BY DENI CONNOR

HOUSTON — Compaq last week debuted a slew of products that make it easier for users to increase server performance and boost data storage capacity.

The company, which recently reorganized to increase integration among its server, storage and services groups, announced:

- A two-node cluster for Windows NT and NetWare.
- A seven- and 12-port Fibre Channel hub.
- A 64-bit Ultra SCSI disk controller.
- Two Ultra2 disk drives.
- The AlphaServer GS60E.

The two-node cluster, dubbed Toucan, is an entry-level cluster of Proliant 1850R servers aimed at customers running a single application, such as communication, messaging, Web, or file or print sharing. The Windows NT cluster uses Microsoft Cluster Server; the

NetWare cluster uses Novell High Availability Services.

Compaq estimates that 10% of Windows NT servers shipped are being sold in clustering configurations, a result of users considering their messaging and communications applications to be mission-critical.

"The two-node cluster will reduce the amount of outage in my department. I can't justify buying an enterprise clustering product, and the Toucan cluster lets me use Microsoft Cluster Server," says Jim Nocella, senior network administrator at MCI WorldCom in Piscataway, N.J.

Nocella's network is used 24 hours a day, seven days a week. He currently uses the Toucan cluster for file and print sharing, and is considering using it on SQL Server and Microsoft Exchange.



Compaq's AlphaServer GS60E is built for large application duties.

Pricing, however, is what will set the Toucan servers apart from the crowd: The servers start at \$15,000. Each cluster consists of two Pentium III-based Windows NT or NetWare servers that share common external storage. The servers are connected to the external storage via a seven- or 12-port Fibre Channel hub. Both servers are operational; if one server fails, the backup server will take over. The cluster can address up to 234G bytes of extra storage.

Windows NT clusters can cost as much as \$100,000 for general-purpose, business-critical applications and up to \$1 million for very large databases or decision-support systems.

"The price of this cluster configuration is amazing. Compaq is taking a lot of See **Compaq**, page 22

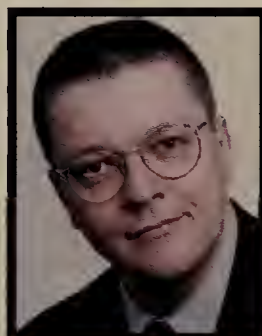
HP executive leads thin-client computing crusade

BY JOHN COX

It's too early to tell whether Hewlett-Packard's new boss Carly Fiorina shares the enthusiasm of her subordinates for thin-client desktops. HP last week named Fiorina president and CEO to replace retiring CEO Lew Platt.

But that's not likely to stop Wolfgang Bartles, the recently appointed general manager of HP's thin-client operations, from trying to sell Fiorina or MIS groups on the benefits of thinking thin.

Bartles last spring helped launch the European introduction of HP's thin clients, which are relabeled Windows-based terminals bought from Wyse Technology and loaded with HP's own software. HP also offers Netstation devices, which can access Unix and mainframe applications. Already, European sales have outstripped U.S. sales, a gap that Bartles plans to close.



HP's Bartles is pushing his company to think thin.

He's been building much closer relationships with HP's Network Server Division, its consulting group and HP's own internal MIS group, which acts as a test site for thin clients, HP servers and applications. He's also looking at closer ties to HP's wireless, handheld products group, which he sees as an ideal extension of the thin-client gospel.

"I think HP sees the big picture," says Jason Traeden, senior systems analyst at the University of Utah Hospital and Clinics in Salt Lake City. The hospital, an HP customer, has deployed about 1,800 Windows-based terminals that access applications on groups of about 15 multiuser NT servers. The servers run general office applications as well as specialized medical programs.

Traeden gives HP high marks for its service and support, the way the vendor has linked the terminals to HP's existing systems management applications, such

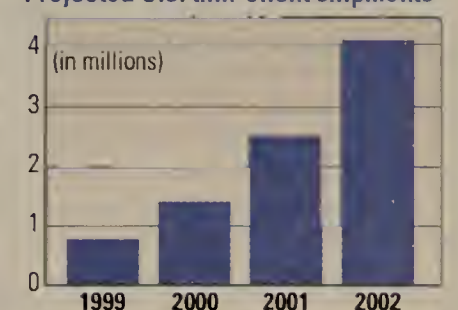
as TOP Tools and OpenView, and its server hardware and software. "Our HP sales representatives are always talking to us about thin clients," he says.

Corporate MIS groups and a new breed of service providers are ripe for the lower support costs, easier management and faster application rollouts that See **HP**, page 22

Thin clients to get fat

Analysts predict that the thin-client market will expand by more than 400% over the next four years.

Projected U.S. thin-client shipments



SOURCE: IDC, FRAMINGHAM, MASS.

Compaq,
continued from page 21

headaches away by packaging it in a box and making it easy to install," says James Gruener, an analyst with Aberdeen Group in Boston.

Compaq is not the first company to create an in-a-box cluster. Data General has had one for several years.

According to Gruener, Data General's NT Cluster-In-a-Box is for enterprise networks, rather than for remote offices and small and midsize busi-

nesses. "How many people want to live without their e-mail server or deal with their small Oracle database being down if it runs their business?" Gruener asks.

The Toucan cluster is available in rack or pedestal configuration and is aimed at businesses that may not have an administrator available locally for installation, configuration or management.

Remote management is available via Compaq Insight Manager XE and the In-

telligent Cluster Administrator, which allow Web-based monitoring.

The Proliant clusters will be available in the first part of the fourth quarter.

Compaq also unveiled several complementary storage products.

The disk controller, called the Smart Array 4200 Controller, is a four-channel, 64-bit, PCI-based Ultra SCSI disk controller for Proliant servers, which increases performance between the system CPU and the disk drives

by as much as 400% over previous versions, the company says.

The StorageWorks RAID Array 4000, which attaches to the Toucan cluster, is a dual-channel Fibre Channel storage subsystem that scales to 3.2 terabytes per Windows NT or NetWare server.

The controller costs \$2,200 and will be available in August. A base-configuration StorageWorks RAID Array 4000 with dual host adapters and controllers and the Cluster Series F Model 200 Kit will be available in August for approximately \$17,000.

Further, Compaq rolled out a less expensive, high-end AlphaServer. The AlphaServer GS60E is designed for data-warehousing and business-intelligence applications.

Compaq claims that the GS60E has 30% to 40% faster application performance than previous models because of the EV67 microprocessor and increased cache.

The GS60E has up to six processors per chassis, up to

24 PCI slots and 28 internal storage bays.

A dual-processor GS60E with 1G byte of RAM will be available in August for \$85,000.

Pricing comparisons from Compaq show the GS60E to fall in the middle between Sun E3500s and HP N4000s. ■

HP,
continued from page 21

thin clients offer, Bartles says.

"These service providers, even more than large corporate accounts, will drive thin-client computing," he predicts. Application service providers use thin-client networks to host software on their own server farms and rent out access over dedicated, high-speed nets to corporate users.

Corporate users now are doing more with thin clients than simply replacing Unix and mainframe "green screen" terminals, Bartles says.

"What's new is that customers are rolling out thin clients with server-based office productivity applications," he says. Federal Express, which has been an IBM mainframe devotee for years, has started selecting HP Unix servers for some applications.

"Then, they added our NT servers to roll out Microsoft Office applications to their users via thin clients."

Bartles will debut new thin-client models by year-end and is working with HP executives to woo the service providers to embrace HP's thin-client offerings.

"We need to connect all these products together and sell them as a complete package," he says. ■



Internetworking Monitor . Kevin Tolly

SWITCH TESTING ROLL CALL: ON BOARD OR AWOL?

Don't look now, but a number of the industry's most prestigious switching vendors are getting cold feet over switch performance and interoperability tests co-sponsored by *Network World* and The Tolly Group.

What is it that these companies don't want you to know?

There is a small collection of vendors — namely Cabletron, Foundry Networks and 3Com — that stand out for following through on their commitments to test switch performance. On the interoperability side, Cisco, Cabletron, Foundry, Hewlett-Packard, IBM, Lucant and Nortel Networks are committed to test their switches. These vendors don't have anything to hide.

Back in January, 21 out of 26 switch makers invited to participate in the joint *Network World*/Tolly Group SwitchMetric committed to test products. This spring, only nine vendors served up 15 products for the first round of testing. Now, we're trying to complete Round 2

of the SwitchMetric testing in time for September's NetWorld+Interop show, and even fewer vendors have committed to testing.

As we hold a roll call prior to testing, it's apparent that vendors that originally committed to the project, such as Nortel, Intel, FORE Systems, Alcatel/Xylan, Compaq, NBase, Neo Networks and Alteon, are still nowhere to be found. Cisco, it should be noted, never agreed to participate. The reasons for this absenteeism vary. Excuses range from bad timing (meaning the vendor can't get the switch to the testbed due to demand), to some vendors that preferred to test products at a later time.

All excuses aside — you'd think if the available switching products live up to the hype, vendors would rush to test their gear against competitive offerings.

Our other test, the LAN Switch Interoperability Study, naturally focuses on switch interoperability. While we didn't insist on vendor

commitments, the assumption is that the vendor community would want to prove to buyers that their products support a core set of technology standards, making them interoperable in multivendor networks.

Out of almost 30 invitations sent to switch makers, as of mid-July only a half dozen vendors (mentioned previously) were willing to prove that their switches can interoperate with others. In an industry where switch interoperability is of paramount importance, more vendors should show up for the dance.

Companies such as 3Com, Intel, Extreme Networks and NBase have flat out declined our invitation to prove their products are interoperable. Meanwhile, others, such as FORE, Alcatel and Network Peripherals, have expressed interest but still haven't committed as our testing date draws near.

Back in May, *Network World's* Editorial Director John Gallant took Cisco to task in an editorial over the fact that the market power-

house at the time was the only major switch vendor to reject an invitation to participate in our joint SwitchMetric program.

Now it appears Cisco isn't the only vendor reluctant to demonstrate the true capabilities of its switches.

By the time you read this column, some of these vendors may have jumped on board. But you can help by telling your vendors you want them to participate in these industry benchmarks, or e-mail John Gallant (jgallant@nw.com) or me.

Tell us why these programs are important to you, and tell us which vendors you want to participate in these programs. We'll take your case to corporate management, too.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300, ktolly@tolly.com or www.tolly.com.

More Online

- More Toucan details from Compaq.

- Overviews of recent NT and Unix clustering announcements.

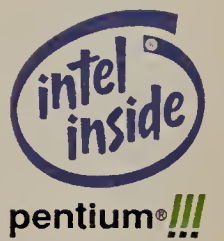




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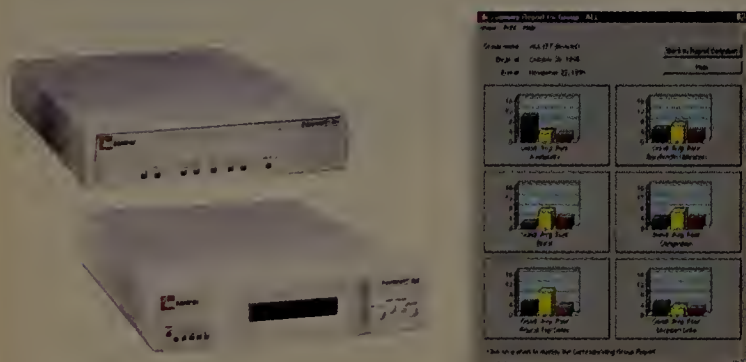
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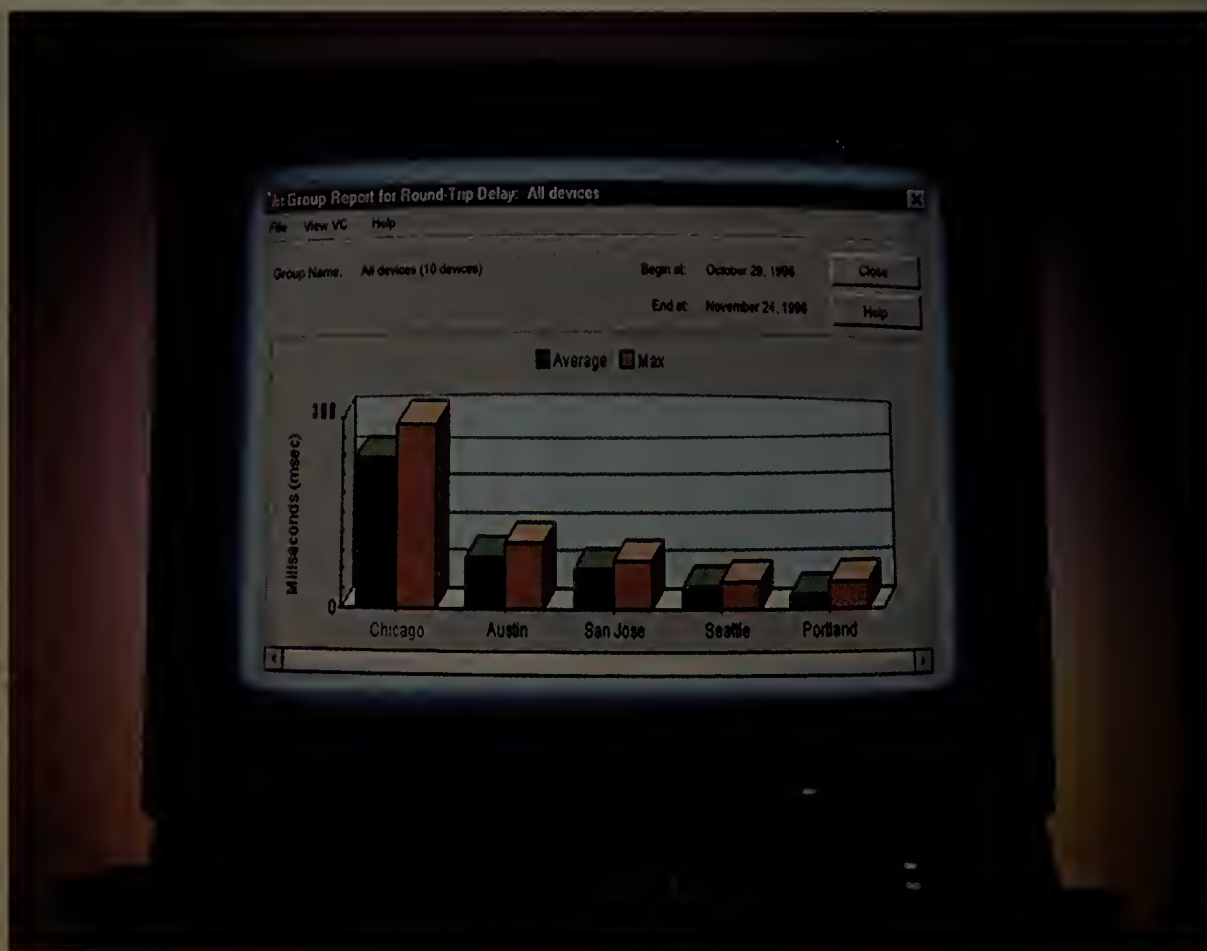


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**The Internet, Extranets, Interexchange
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Briefs

Bell Atlantic Mobile is buying the remaining interest in **Frontier Cellular** from Frontier Corp.

Bell Atlantic Mobile already owns 50% of the wireless service provider. Complete ownership of Frontier Cellular will give Bell Atlantic Mobile 400,000 more customers in the Northeast. Frontier Cellular offers digital cellular wireless services in the Buffalo, Rochester, Syracuse, Utica, Rome and Binghamton, N.Y., areas, and six other smaller markets, four in New York and two in Pennsylvania. Bell Atlantic Mobile did not release terms of the deal.

Bell Atlantic Mobile: www.bam.com

Only one month after the Federal Communications Commission approved Vodafone's \$58 billion acquisition of AirTouch, the newly combined company is out shopping. **Vodafone AirTouch** last week announced plans to acquire **CommNet Cellular** for \$764 million. CommNet Cellular offers wireless services to more than 360,000 customers in Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and some cities in Idaho, Iowa and New Mexico.

Vodafone AirTouch and CommNet Cellular expect the deal to close by year-end.

MCI WorldCom has extended its owned and operated global ATM network to Hong Kong, Tokyo and Sydney, Australia. MCI WorldCom has placed Cisco ATM switches in the three cities. The decision matches the carrier's recent selection of the Cisco-based legacy WorldCom ATM network in the U.S. as its permanent platform, as opposed to MCI's Newbridge-based network. In Tokyo and Sydney, MCI WorldCom is also building out fiber networks.

Frame relay + EDI = 'extranet'

Electrical manufacturers, distributors share e-commerce over MCI WorldCom managed net.

BY DAVID ROHDE

CONYERS, GA. — Here's a different kind of electronic commerce extranet — one that if you scratch beneath the surface, you'll find a whole lot of good old frame relay.

The Industry Data Exchange Association (IDEA), an electrical parts industry consortium, is in the process of linking hundreds of independent manufacturers and distributors into a single network run by MCI WorldCom.

The idea behind the network, called IDExchange, is to let distributors obtain specifications and pricing information, and eventually place orders, on a bewildering array of hundreds of thousands of electrical industry parts without having to deal with different electronic data interchange formats from each manufacturer.

IDEA and MCI WorldCom are labeling IDExchange an "extranet." But because it's really an inter-enterprise managed frame relay network, rather than an all-IP virtual private network (VPN), users will have to do more than find a browser-equipped PC and dial past a firewall. And they may have to dig into their pockets a little bit to take advantage of the service.

How IDExchange works

Each company that participates will become a customer of MCI's managed frame relay service.

MCI will configure and manage a Cisco Model 1605 router for each customer premises site and provide a frame relay connection of the user's choice, from 56K bit/sec to T-1. At 56K, the entire managed service costs \$850 per month, including the local access line, plus an unspecified IDEA mem-

bership fee. The managed network fees rise to \$2,900 per month for a full T-1 connection.

All frame relay circuits will terminate at MCI's network management center in Cary, N.C. In turn, the Cary center will maintain a T-1 frame relay link to a large database of EDI records called the Industry Data Warehouse, built under a separate contract by Triad Systems of Livermore, Calif.

By providing a permanent connection to the network via frame relay, the data warehouse can automatically push information, such as price changes and parts' inventory status, to individual users.

IDEA and MCI WorldCom officials say the expenditure is easily justified. In the past, distributors have generally relied on dial-up value-added networks (VAN) that charge by the kilobit — including MCI

WorldCom's own EDI*Net, which typically charges 20 cents per kilobit. But for small distributors that cannot justify the higher fixed charge, MCI will still offer a dial-up option. However, those users cannot receive pushed information or engage in specialized member-to-member applications that some manufacturers are developing.

Sold on IDEA

IDEA and MCI officials are so confident of the electrical industry's interest in such a concept that they have signed a three-year contract to construct IDExchange while still selling the concept to the membership.

"It's a 'build it and they will come' network," says John O'Brien, a regional manager for MCI WorldCom who helped set up the project.

IDEA considered many traditional VANs to develop the network before

settling on MCI.

"I don't believe that anybody else would have come off the usage-based model as much as MCI WorldCom," says Jeff Kernan, chief information officer at Lithonia Lighting, a large electrical parts manufacturer in Conyers, Ga.

Kernan, who is chairman of the electronic business and standards committee of the National Electrical Manufacturers Association (NEMA), helped develop the specifications for the Industry Data Warehouse.

The product records are based on the ANSI X.12 EDI standard, but with modifications specific to the electrical industry.

"We've built a subset of descriptions on top of it," Kernan says. "A distributor probably wants to talk to multiple manufacturers and doesn't want to learn multiple [database standards] for each manufacturer."

What's at stake

Industrywide, the inconsistency among EDI implementations results in a 20% rejection rate for orders and information requests, he says.

Kernan says the IDEA consortium — a partnership between NEMA and the National Association of Electrical Distributors — preferred to stick with frame relay rather than go with an IP VPN right now. IDEA wanted a purely closed network, rather than allow public access controlled by firewalls.

"MCI also brought us a VPN [proposal], but it would have been substantially more expensive to support," Kernan adds.

More information about IDEA and the IDExchange extranet is located at www.idea-inc.org. ■



John Kernan, of the National Electrical Manufacturers Association, says 20% of orders and information requests industrywide were rejected in the past due to inconsistent EDI implementations.

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Eye on the carriers . David Rohde

SBC WASTES ANOTHER YEAR ON MERGER POSTURING

Almost 14 months ago, I wrote about a conversation I'd had with SBC regarding the company's just-announced proposal to buy Ameritech.

SBC was claiming that somehow it was necessary for the firm — already the most imposing telephone company in the land — to merge with

Ameritech before Ameritech could commit resources to competing outside its region.

So I said: Great, you finally want to

be a competitive local exchange carrier (CLEC). Tell us a little about your plans. What switches will you use? How many route-miles will you construct? Will you build all your facilities, lease some or just resell the other Bells' lines?

SBC couldn't answer any of these questions.

Recently SBC announced an agreement with the Federal Communications Commission to apply "conditions" to the Ameritech merger if the five commissioners OK the deal. Under the conditions, supposedly SBC will pay fines if it fails to enter 30 new markets as a CLEC.

So I figured it was time to call SBC and revisit these questions. (Just for fun, call up last year's column at www.nwfusion.com/forum/0601rohde.html and compare this year's answers with the last set.) Here is the latest, remarkably unchanged line of questioning:

Q: Which vendors' switching and transmission equipment will you use?

A: We don't have the answer to that.

Q: How many route-miles will your new networks cover?

A: We're not saying anything about that yet.

Q: There are three methods of CLEC entry: Resell the incumbent's services, lease unbundled network elements or build all your own facilities. Which will you use?

A: All of the above, depending on the marketplace. There is not a single strategy that we've settled on.

So much for the past year. What's even more worrisome is what's going to happen over the next year. Under the unpublicized fine print of the merger conditions, SBC actually only has to enter three cities in the first year after merger approval. And the initial definition of "entering" a city is — get this — installing one switch and serving one customer.

SBC recently filed for official CLEC status in Massachusetts, Florida and Washington. That move matches SBC's announced intention to compete first in Boston, Miami and Seattle.

So I asked: Have you filed for CLEC status in any other states?

Answer: Not yet.

Here's a question for the FCC staff: When you negotiate deals with legacy carriers in exchange for approving questionable mergers, is it possible that these deals train the carriers to forget the market and just do the bare minimum that their lawyers tell them they have to do?

Robde is a senior editor with Network World. He can be reached at drobde@nww.com.

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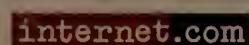
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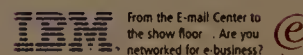
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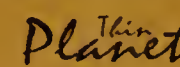
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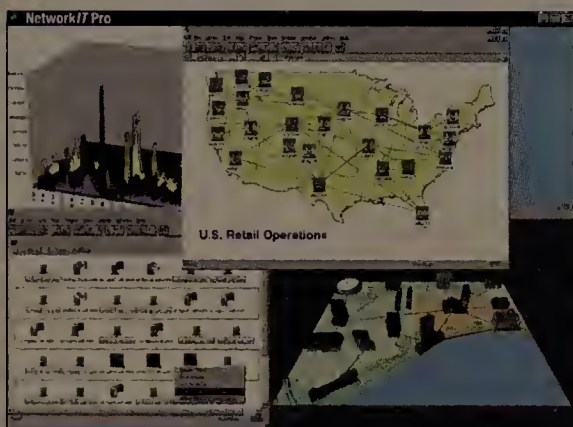
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Briefs

Kana Communications, a maker of software that lets companies respond efficiently to a high-volume of e-mail, has named Michael McCloskey as its CEO.

Previously, McCloskey was president of Genesys Telecommunications Laboratories, a maker of customer interaction management software. Company Chairman and President Mark Gainey gave up the CEO title to make way for McCloskey. Kana Communications is based in Palo Alto.



Michael McCloskey takes over the reins at message management company Kana.

Worldtalk Communications has announced the sale of its NetJunction E-Mail Connectivity and Directory integration business to **Wingra Technologies**. Wingra will assume support responsibilities for current NetJunction customers and become a reseller of Worldtalk's NetTalk e-mail and directory integration tools. Worldtalk is selling the business to focus more on the Internet security market.

Worldtalk did not disclose the financial terms of the sale.

The five dozen Democratic representatives interested in high-tech issues, who together call themselves the **New Democrat Coalition**, have created a policy agenda covering electronic commerce, legal and educational issues.

The group's "e-genda" can be found at www.house.gov/adamsmith/NDC_egenda.html. The Republican equivalent can be found at www.freedom.gov.

Computer Associates chases e-biz

BY JEFF CARUSO

NEW ORLEANS — Computer Associates in the coming months will expand its e-business offerings with a new product line for securing business transactions and a new version of its management software.

At last week's CA-World user conference, the company introduced the eTrust line of tools that use security to help companies conduct business over the Internet.



The company also demonstrated how the next version of its Unicenter systems and network management software can be used to help companies manage e-business.

Management software for e-business is becoming more important as companies become more intertwined.

"Businesspeople have to engage IT to build wealth," says Charles Wang, CA's chairman and CEO.

The eTrust line will include encryption controls, firewalls, intrusion-detection software, authorization software and other security tools targeted at business-to-business electronic transactions.

The CA products will use the IETF's

Online Certificate Status Protocol (OCSP), so businesses will be able to conduct transactions over the Identrus banking network. OCSP specifies how a client may obtain certificate status information online from an authorized certificate server. Identrus, a network established by several large banks over the 'Net, provides a way for trading partners to validate each other's identity.

The products will be released in the next quarter as individual products and as an integrated package. The eTrust line will include existing CA security tools, new tools and some that were acquired along with Platinum earlier this year, such as Platinum Policy Compliance Manager and Platinum Audit Central.

Users at Office Depot applauded CA's moves. Office Depot wants to be able to monitor conditions in its customers' business environments, says David Guzman, senior vice president of systems development and architecture at the office supply giant. By knowing what printers a customer has and

detecting if those printers are about to run out of toner, for example, Office Depot would know it needs to supply those customers with more toner.

"If we could apply knowledge about customers' infrastructures to events in their business, that's a true partnership," Guzman says. He hopes to get those capabilities from the upcoming version of Unicenter.

The next version of Unicenter, The Next Dimension, will be more able to manage parts of a business not usually managed by software, says Brandon Musler, director of product strategy of CA. "Non-IT devices, vehicle fleets, soda machines — you name it," he says.

Unicenter TND is scheduled to ship by year-end. ■



"Business people have to engage IT to build wealth."

Charles Wang, chairman and CEO, Computer Associates

Allaire, IBM, Mercado buy into XML

BY ELLEN MESSMER

Last week Allaire, IBM and Mercado each unveiled electronic commerce products that boast newfound support for XML, the format-neutral way to simplify document interchange on the Web.

Allaire this fall plans to ship an XML-based add-on to its ColdFusion application server that will let customers include e-commerce functions to their sites. IBM next month will ship its flagship electronic catalog suite, Net.Commerce, powered with XML. This month, electronic catalog vendor Mercado Software will ship its Intuifind e-commerce catalog servers with the ability to store data in XML format.

Allaire is devising a development package called Spectra to add metatag support to its NT-based ColdFusion application server. Allaire's Spectra add-on package, expected to cost \$3,495 per server, will also let the ColdFusion application server tackle e-commerce tasks that include procurement workflow, content management, transaction processing and personaliza-

tion, so a buyer can get specific pricing.

IBM is taking its first swing at XML for electronic catalogs with its Net.Commerce 3.2 suite, now in beta testing. Catalog Architect, the tool for creating content for the Net.Commerce catalog, will be able to generate text and images in XML format.

One beta customer, the Victoria's Secret e-commerce site, says using XML may help in converting between different data types as catalog content gets moved

around in the production process.

"The content changes every few weeks, and we're often marrying it with outbound e-mail," says Frank Giannangio, vice president of direct marketing for The Limited's technology services, the division in charge of the Victoria's Secret site. Net.Commerce 3.2 suite, which starts at \$5,000, will also have a way to perform "plain-English searches," such as "Show me all the pantsuits in petite sizes."

Mercado is adding XML into its catalog servers, the Intuifind Merchant Catalog for business-to-business and business-to-consumer transactions, and the Intuifind procurement catalog for business-to-business procurement.

Mercado products, available this month for Unix and NT, can send and receive data in multiple formats and aggregate the information for a Web view by buyers. They will also be able to convert that into format-neutral XML.

The Intuifind Merchant Catalog 2.0 starts at \$50,000, and the Intuifind Procurement catalog starts at \$500,000.

IBM: www.software.ibm.com; Allaire: www.allaire.com; Mercado: www.mercadosw.com

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- Get more details on the software mentioned in this story.
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'Net Insider . Scott Bradner

PORTABLE FIREWALL CIRCUMVENTION

A few months ago, I put a new 10G-byte disk drive in my Macintosh 2400 laptop. That expanded the original capacity of the computer

to the point where I could carry the basic business data for much of Harvard wherever I went — if I had a mind to do that and if the university

was dumb enough to let me do it. Sounds unlikely, but all too many businesses let their traveling executives do things that are just about that dumb.

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State of the LAN: Creating a Master Plan for Your Next-Generation Network

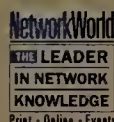
As the industry converges on Ethernet-at-some-speed as the universal choice for Local Area Networks, there is an overabundance of often overlapping options for designing a next-generation LAN. Unless you can comprehend and evaluate all of them, you may choose to delay implementation which will only create more work for you down the road. If you're involved in network design, deployment, and operation of corporate, SP or ISP networks, you need to attend **State of the LAN: Creating a Master Plan for Your Next-Generation Network**. It is the best opportunity to have your most critical LAN management questions answered and stop the buzzing in your head.

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3. Learn about the latest developments in QoS initiatives and the trade-offs between different approaches
4. Examine opportunities for voice-data integration and the convergence of PBX and the LAN
5. Understand the most cost effective methods for integrating legacy LAN topologies and communications protocols
6. Learn how Gigabit Ethernet and ATM complement each other in the enterprise

Moderators

John Gallant, Editorial Director, Network World and **Kevin Tolly**, President, The Tolly Group



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Businesses spend tens of thousands of dollars to install and operate firewalls to protect their corporate secrets from Internet intruders. But in doing so, too many seem to think that installing the firewall somehow magically makes all security problems disappear. There are a number of reasons why this borders on self delusion.

Every study that looks at the perpetrators of effective (if that is a reasonable word to use) network-based intrusion shows the majority are insiders, or outsiders working with inside help. Because firewalls do not keep out people who are already inside, they are of limited assistance in these cases. Installing firewalls also tends to make users and sometimes network managers so complacent that they forget the basics of good network security, such as using good passwords or physical token-based authentication.

This does not mean organizations should forego the use of firewalls, but it does mean they should not assume firewalls are some sort of magic pill that cures stupidity.

Firewalls certainly do not cure the stupidity of corporate executives carrying piles of corporate and often private secrets in plain-text files on their laptops and palmtops. A lot of information tends to pile up on these machines: copies of old e-mail, spreadsheets of budgets, proposals for changing corporate direction or for new products, even auto-logon scripts for dialing in when on the road.

There might be more effective ways to find out what is going on in a corporation than to steal the CEO's laptop, but it would take me a while to think of one.

For a while there have been products around to keep laptops from booting without entering a password, plugin card or serial port attachment, but these can be circumvented by moving the disk drive to another computer.

There is also software that lets the user encrypt files on the disk, but the reliability of this software depends on the reliability of the user taking the time and trouble to do the encryption every time — and not writing the password on the laptop case. The only safe ways to carry corporate secrets on a laptop is to not do so or encrypt the whole disk, and there are products to perform that function. In the end, it is cheaper to lose the data due to a forgotten password than reveal the secrets to the wrong person.

Disclaimer: Harvard's business is not curing stupidity, it is nurturing intelligence. The above is my own too-full disk.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.



Technology Update

An Inside Look at the Technologies
and Standards Shaping Your Network

Ask Dr. Intranet

By Steve
Blass

I am implementing Dynamic Host Configuration Protocol (DHCP) in an intranet with eight subnets. From the router, IP helper

points to two DHCP servers. We have the subnet mask, 255.255.254.0, making two virtual subnets for each real subnet. The first DHCP server handles all even numbers of each virtual subnet, and the other handles odd numbers. If one DHCP server fails, the other can give IP addresses for any subnet. The problem is, clients only take IP addresses from one server unless it is out of IP addresses or it fails. Is there a way to sync scopes on the two servers or a method of creating a backup DHCP server?

Jim Paulin, server manager,
Ford Motor Co.

The IETF is working on the server-to-server communications specification you'll need to get your DHCP servers to work in such a fashion. Until it finishes the specification, you are trapped by your router's implementation of helper addresses and the client's DHCP implementation. It sounds like the first helper address listed in your router always responds first, and your clients accept the first DHCP offer they receive.

If you'd like to modify your DHCP servers, look at the free WIDE DHCP source code package available at www.sfc.wide.ad.jp/~tomy/dhcp/index-e.html. Also take a look at the Host/Subnet Quantities Table listed at www.cisco.com/warp/public/701/8.html to see if your subnet mask is partitioning your network the way you'd expect.

Blass is a network architect at Sprint Paranet in Houston. You can reach him at drintranet@paranet.com.

100Base-SX paves path for all-fiber net

BY DON KNASEL

Ethernet remains by far the most widely understood and deployed LAN protocol. With many networks still running 10Base-FL, administrators are looking for simple, efficient migration strategies that will allow them to upgrade their networks incrementally as users need higher speeds. The proposed 100Base-SX standard will help them find that path.

While optical fiber has become the cabling medium of choice for network backbones and risers, the decision has not been as clear to the desktop. There have been three main obstacles as network managers look to upgrade to Fast Ethernet.

- 10Base-FL and 100Base-FX are specified at incompatible optical wavelengths, 850nm and 1300nm, respectively.

- Since 10Base-FL and 100Base-FX are incompatible, no autonegotiation scheme was developed for optical systems.

- The initial costs of deploying a multimode-fiber-based network are higher than the costs for copper.

The cost gap is closing today due to cheaper optical electronics and a new generation of connectors. In addition, the proposed 100Base-SX standard resolves the wavelength-compatibility issue and provides an autonegotiation technique for fiber.

When the existing standards were written, there was little market demand for fiber to the desktop. However, as speeds have increased, net managers have been confronted with an installed copper network that is not up to the task. Given optical fiber's inherent bandwidth and immunity to interference, it is a good choice for high-speed networks, provided the issues highlighted above are resolved.

A group of Telecommunications Industry Association (TIA) members has recognized the need for an optical-fiber-based network with a migration path from Ethernet to Fast Ethernet.

The resulting development of 100Base-SX was driven by the needs of users who want the benefits of optical

fiber and the future protection afforded by a standards-based network. The proposed 100Base-SX standard calls for 850nm wavelength optics that are compatible with 10Base-FL and reasonably priced. In addition, the proposed standard will provide fiber customers

- Low-cost electronics, meaning the LED devices used in 100Base-SX are the same cost-effective devices used in 10Base-FL.

- Connector independence, in that 100Base-SX can be achieved with any connector that meets the specifications. However, a new generation of small fiber-optic connectors will be rapidly deployed in 100Base-SX products.

The communication techniques spelled out in the proposed standard are designed to autonegotiate between current 10Base-FL and new 100Base-SX systems, while offering detection of non-negotiating devices.

The requirement to support a minimum link distance of 300 meters — as opposed to the 100-meter constraint for copper — lets system designers use centralized fiber-optic cabling systems that provide service to areas where equipment rooms do not exist and cannot be added. It also allows hub and switch equipment to be centralized, which can reduce total network costs and simplify administration.

And by installing multimode fiber, users can upgrade their networks in the future without recabling. This significantly reduces the lifetime cost of a network.

More than 25 companies have banded together to promote 100Base-SX. Several have already introduced prestandard products, with more under development. Interoperability among these devices was demonstrated last fall at NetWorld+Interop in Atlanta.

The first ballot for the proposed 100Base-SX standard, SP-4360, was completed by a TIA committee at the end of February 1999.

At this point, no significant technical issues with the proposal remain. The TIA expects to send the draft standard out for a second ballot soon, with ratification expected in the fourth quarter of this year.

More information on the standard is available at www.fols.org.

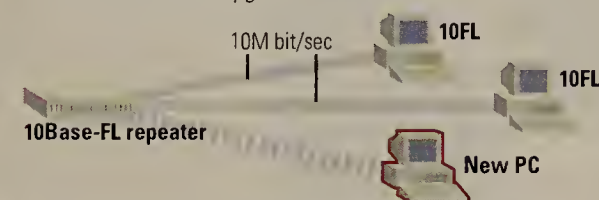
Knasel is chairman of the TIA's FO-2.2 subcommittee on digital multimode systems. He is also vice president of business development at Holocomm Systems.

HOW IT WORKS

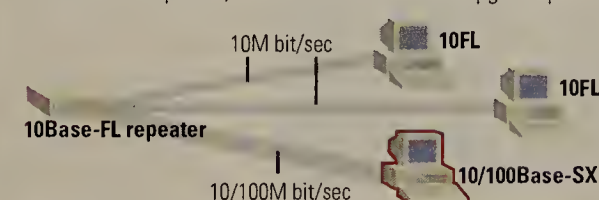
Building bandwidth through 100Base-SX

The emerging 100Base-SX standard will let network administrators upgrade bandwidth incrementally and at a reasonable cost, advocates say. Equipment supporting the standard will let customers upgrade to Fast Ethernet speeds today and move more easily to an all-fiber network that will support Gigabit Ethernet down the road.

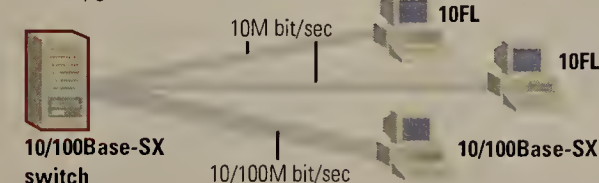
1 A new PC is added to a 10Base-FL LAN segment that's slated for a future upgrade to 100Base-SX.



2 A 10/100Base-SX NIC is installed on the additional PC, providing automatic configuration and autonegotiation with 10Base-FL repeater, as well as a bandwidth upgrade path.



3 A 10/100Base-SX switch is bought to replace the 10Base-FL repeater, and the SX switch makes the 100M bit/sec link automatically. 10Base-FL NICs can be retained, or NICs can be upgraded to 10/100Base-SX.



with a means to upgrade to Fast Ethernet speeds today and install a fiber infrastructure that will support Gigabit Ethernet, thus making future upgrades easy and affordable.

The 100Base-SX standard provides for:

- Operation over at least 300 meters (full duplex) on Fiber Distributed Data Interface grade 62.5/125 micron multimode fiber.

- Interoperability with the installed base of 10Base-FL.

Gearhead — inside the network machine . Mark Gibbs

TOWARD A BETTER UNDERSTANDING OF SOCKETS

The term “sockets” crops up all the time in the TCP/IP world, but do you really know what it means? Basically, it is the method of identifying a specific process running on a machine that is accessible via an IP connection. More importantly, it is also the common name for the standard API for TCP/IP.

The Sockets API — also called the Berkeley Sockets Interface — was developed at the University of California at Berkeley for the 4.1c release of BSD Unix in the early 1980s (by the by, BSD stands for Berkeley Software Distribution). The simplicity of the interface made it common in Unix variants, including SCO, Linux and SunOS. Ultimately, it was supported by Windows (95, 98, NT and CE), NetWare, BeOS and a slew of other operating systems.

Berkeley Sockets provides applications with two ways to access network transport services: connection-oriented (a.k.a. session- or stream-oriented), whereby TCP is used to maintain a channel between the client and server; and connectionless (a.k.a. datagram) communications,



which use the User Datagram Protocol (UDP) to transfer data packets from one machine to another without guaranteed delivery.

The concept of sockets is straightforward: To send a message to a machine is not enough — you need to be able to send the message to a specific software process, an end point for the communication. By giving each service process running on a machine a “port” — a numeric value used to identify the process — a client application can distinguish between, say, a file transfer service and a Web service.

The Internet Assigned Numbers Authority (www.iana.org) sets the port value for a given service. For example, Web servers, by default, use

TCP connections on Port 80. FTP servers are a little more complex, using TCP on Port 21 for commands and Port 20 for data transfers.

Protocols such as echo (Port 7) use UDP or TCP, while SNMP (which uses Port 161) only uses UDP. Most services can be allocated to different port numbers if required. For example, a Web site might run a second Web server on Port 8080.

It is the combination of a port and an IP address that makes a socket. Each client application has a unique socket associated with it, while the socket for a service process may support multiple instances of a service.

For example, a Web server might receive a number of service requests on Port 80 in a short period. Instead of handling the requests on a first-in, first-out basis, the server could launch a copy of itself for each request. Knowing the client's socket allows the results of each request to be returned to the correct client.

This strategy ensures that service requests that take a long time to complete (for example, having a Web server-based application perform a

database lookup) don't block other requests that can be satisfied quicker (such as simple Web content retrievals).

The socket API, while simple, is not particularly elegant, and programmers usually access TCP/IP communications through higher-level APIs, such as Remote Procedure Calls.

Under Windows, of course, things are different, and there's a variant of the Berkeley Sockets Interface specifically for Windows called, not too surprisingly, the Windows Socket Specification (WinSock).

Currently, most of the Windows market uses the WinSock 1.1 implementation, but Microsoft is slowly but surely moving the market toward WinSock 2, described by some as WinSock 1.1 on steroids.

The bottom line is that due to the rise of the Internet and TCP/IP, sockets are now the dominant communications mechanism and look likely to remain in that position for a long time to come.

Send a message to the Gearhead socket at gh@gibbs.com.



Security alert

How many holes can you find in your network? You know there are people out there trying to break in and wreak havoc. But how do you keep up with the latest vulnerabilities — and their patches?

This week, we start a new feature to keep you up to date on all those network and application holes. Security Alert is a daily digest of the latest security bulletins and news from

key security and application vendors, watchdog organizations, *Network World* and the IDG News Service.

On Security Alert's main page, you'll find the latest bulletins, in reverse chronological order, each with a link to a more in-depth article or document on the specific problem.

We've also begun building a database of bulletins and articles on key security issues and technologies from *Network World* and around the 'Net. You'll find everything from

Network World Reviews, Buyer's Guides and Technology Explainers, to links to other security sites and resources. It all starts at *DocFinder: 3936*

Knowledge is good

Network World Editor John Dix is sick of those sweeping 30,000-foot-view buzzword-orama catch phrases that say absolutely nothing and yet seem to spew from the mouths of network vendors and journalists (who should know better) like a broken water main. See what he proposes to do about it.

DocFinder: 3939

Nutter's Help Desk

Ron Nutter helps a reader whose NT network seems unable to resolve a couple of host names. The IP addresses work fine, but when he tries to connect across Remote Access Server with names, he can't connect. See what

Nutter recommends and add your own suggestions.

DocFinder: 3934

NT service packs

Speaking of Nutter and NT, his column last week on getting a pair of recalcitrant NT workstations to come back to life sparked a discussion on the importance of installing NT service packs and drivers in just the right order.

DocFinder: 3941

Linux bigots?

Last week, Jeff Shapiro wrote about the reaction he got from Linux users to an earlier column on why Windows 2000 will be the desktop operating system of the future: a lot of ad hominem attacks.

As you might expect, last week's column also generated a lot of comments from Linux users (who, if you ask us, have overtaken NetWare users as the most vocal proponents of their preferred operating sys-

tem). See what they had to say, and add your own comments on the future of Linux.

DocFinder: 3942

SANs

Storage-area networks are increasing in popularity. Need to bone up on them? Link to our SANs Net Resources page. You'll find primers on SANs and related technologies such as Fibre Channel. And one click will take you to an archive of recent *Network World* stories on the technology.

DocFinder: 3943

Help Desk

Ron Nutter is standing by to answer your networking questions. Read his column every week on Fusion. *DocFinder: 2450*

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Management Strategies

Career Development, Project Management, Business Justification

Adventure abroad

Now's the time for IT professionals with wanderlust to take advantage of overseas job opportunities.

BY DEBORAH RADCLIFF

Mike Young, a network security specialist from Schaumburg, Ill., is mulling over a \$120,000-per-year job offer that includes a free BMW. The only hitch: The job is in England.

Deirdre Ryan exchanged the hustle of New York for the bustle of Dublin in February when she moved to Ireland and took a job as a Web developer.

And Darryl Sanders, an avid rugby player who lives in Massachusetts, is looking for a network management job in Ireland so he can pursue his sport with a hard-core team.

Witness the latest twist in the global IT work force shortage: Technology workers cashing in on a seller's market to live and work abroad.

"There's a really interesting war going on," says Decklan French, president and CEO of IT Staffing, an international recruitment firm in Toronto. "It used to be companies stealing IT employees from one another. Now, it's countries stealing these workers from each other."

In the U.S. alone, more than one million new IT jobs will need filling between 1994 and 2005, according to the Bureau of Labor Statistics. Virtually all developed countries struggle with similar shortages of IT workers, according to Kelly Carnes, deputy secretary of technology policy for the U.S. Department of Commerce.

"Many countries, like Canada, England and Ireland, have put programs in place to import as many high-tech workers as they can on an unlimited basis," French says. His firm placed 200 American IT workers abroad last year — mostly in Ireland.

Thanks to her Irish grandparents, Ryan entered Ireland through its "Come Back to Ireland Program," which gives Irish passports to first- and second-generation immigrants, hence avoiding a lengthy application process for work visas.

"I'll probably stay here in Dublin for a year, then I might go to Amsterdam," Ryan says. "I'm considered a member of the European Union, so any country in the EU will take me."

While Young is drawn to England because of the money and perks, Ryan's reasons are less tangible: She took a pay cut to work in Dublin, a city with a cost of living comparable to that of New York. Ryan simply wants to broaden her world, get in touch with her heritage and realize the dream she's always had of living in Ireland before she settles down somewhere.

Her experience in Dublin has thus far been positive. The people there are much more open and friendly, she says. And she's working 10 hours less per week than she did in New York. Ryan works for Small Planet Ltd., a division of International Data Group (IDG) affiliate Scope Communications.

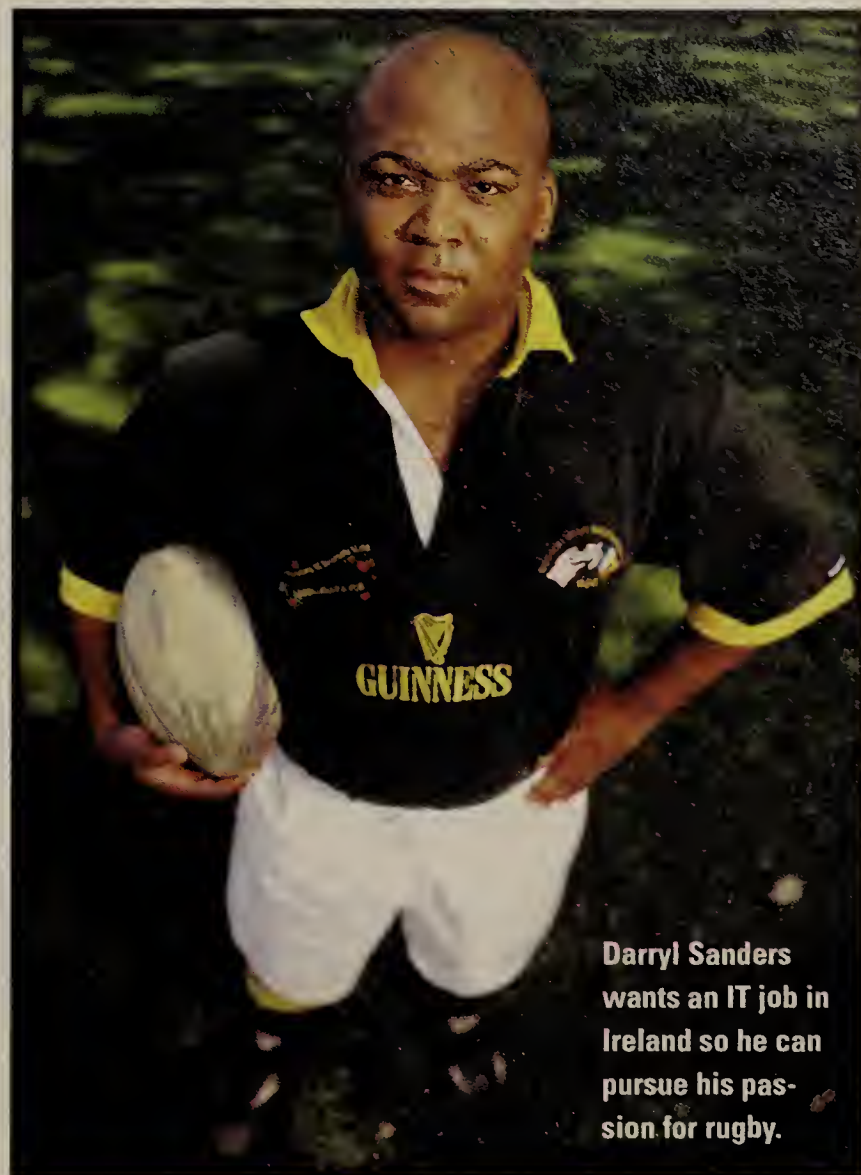
Like Boston-based IDG, parent company of *Net-work World*, many other U.S. companies have set up shop in foreign countries. As of 1997, 2,618 American businesses had established overseas operations, according to the Commerce Department's Bureau of Economic Analysis.

Ireland, in particular, is a hot spot for the IT industry. American Airlines, Dell, Hewlett-Packard, Microsoft and others have moved their call center and Web development operations to the Emerald Isle.

"Ireland is the second-largest exporter of software. We have the largest number of call centers in Europe, and many companies centralize their shared services here," says Sylvia Harrison, managing director for Headhunt International in Dublin.

With a population of just more than one million, Dublin is often referred to as the "Silicon Valley of Europe," IT Staffing's French says. Network and Web development projects are taking place throughout the country, so there are also many IT jobs concentrated in Cork and Galway. England and Australia are also strong draws for technology workers. According to Young, there's a shortage of Cisco router engineers and WAN security engineers in England.

Moreover, French notes that network jobs are



Darryl Sanders wants an IT job in Ireland so he can pursue his passion for rugby.

plentiful in Amsterdam, which is strong in telecom technology.

"It's a hell of a great place to have fun," he adds.

If work abroad sounds tempting, remember that many foreign companies in need of network professionals are behind the technology curve. Young suggests looking for work with American-based companies because they have more up-to-date IT infrastructures.

Don't accept a job unless it builds up your resume, French recommends. And check the local marketplace for other work to make sure you have another job to fall back on if the position you were hired for doesn't work out.

Of course, the same criteria applies to domestic positions.

"Make sure it's a viable project with a high likelihood of success. Make sure you're using tools that will help you in the future," French says. "At the end of the day, that's what you're going to be judged by."

Radcliff is a freelance writer in Northern California. She can be reached at DeRad@aol.com.

More Online

- Learn more about what it's like to work abroad.
- Check out these sources of international IT job listings.

www.nwfusion.com



Editorial Insights

QoS counts, so stand up and be counted

Promises, promises. Just about every Gigabit Ethernet vendor has promised to put quality-of-service (QoS) capabilities into its gear. This will, they pledge, let switches prioritize traffic and improve network reliability for application-specific data and help curtail network congestion.

Network buyers are apparently taking the promises seriously. A recent Infonetics Research survey shows that network professionals like you consider QoS support second only to security as the most important feature in a LAN backbone switch.

While most vendors have remained true to their words and have added application-aware QoS capabilities, the jury is still out on whether these new capabilities yield any benefit for customers. There have been few public tests that measure how various vendors' QoS implementations stack up.

Well, consider this a roll call for the Gigabit Ethernet switch vendors that have made QoS promises. We have invited more than two dozen QoS vendors to stand up and be counted as part of the upcoming *Network World* Gigabit Ethernet backbone switch Buyer's Guide.

The Silicon Valley Networking Lab (SVNL), a *Network World* Test Alliance partner, has developed a new Enterprise Switching Equipment Benchmark that will give users a measure of how well switch vendors have delivered on their QoS promises.

The point behind the QoS portion of this test is to characterize the effectiveness of each vendor's QoS implementation for real-world enterprise networks. SVNL engineers will generate simulated traffic flows that deliver 802.1p and/or IP/ToS prioritized traffic to these switches using industry-standard test equipment. Prioritized traffic will be sent to oversubscribed switch ports while SVNL engineers see how each QoS mechanism reacts.

SVNL engineers will also test and compare the backbone switches on performance, manageability features and Layer 3 routing.

So if you are looking at Gigabit Ethernet switching equipment from a specific vendor, encourage that vendor to take up our challenge and participate in this new test so you know whether the vendor is living up to its promises.

Vendors interested in participating in the test must contact Reviews Editor Ann Sullivan (asullivan@nww.com) by Aug. 6.

— Christine Burns
Test Alliance Director
cburns@nww.com

Message Queue

DO THE MATH

While the article "Bank charges ahead with fuel cells" (June 28, page 64) is interesting and thought-provoking, it certainly seems to give a new definition to reliability.

According to my trusty spreadsheet, 99.999% reliability translates into 5.3 minutes of downtime, not 53 as stated in the article. And 99.999999% translates into three-tenths of a second outage, which is less than the article's stated 3.1 seconds.

When dealing with systems where outages cost \$6 million per hour, these are not minor discrepancies.

Rick Dicks
Principal technical specialist
AT&T
Dallas

WINDOWS 2000 WARNING

Regarding your article "Ready or not, here comes Windows 2000" (June 28, page 1):

As a survivor of the update from Novell's 3.1x platform, which was only bindery, to the 4.x platform, I'd like to issue a warning to network managers who are die-hard NT fans and don't want to hear anything about Novell: Learn from what Novell did six years ago.

Here are a few things to think about in the comparison of Novell six years ago and NT today.

First, it is said that Microsoft wants us to update all NT 3.51 servers to NT 4.0 so the update will run smoothly. Novell said that all versions from 2.x could upgrade easily to NetWare 4.x, which was the case. Microsoft should make 2000 backward-compatible, especially for ease of upgrading. Will we poor network managers have to make a double upgrade from 3.51 to 2000?

If Microsoft's network division is anything like its Office software division, we are in trouble. About a month after the Office 2000 suite has come out, it is close to impossible

to get Office 97. A lot of organizations are still stuck with going to Office 97 because their canned software packages require it and will not support Office 2000. Will this be the same with NT 3.51 users who have to migrate to NT 4.0, then Windows 2000? Will we even be able to get NT 4.0?

Second, from everything I have read, seen and experimented with, it looks like Windows 2000 is very similar to NetWare 4.x and especially NetWare 5.x. If this is the case, it would behoove network managers to learn Novell 5.x.

Third, doesn't IntelliMirror sound a lot like ZENworks? It sure does to me.

Fourth, Novell had problems with Version 4.0 when it came out, and within approximately two to three months, it released Version 4.01, which fixed many problems.

Knowing how Microsoft operates, with NT 4.0 being on Service Pack 4 and software being released with bugs in it, wouldn't it be prudent to maybe have a NetWare 5 duplicate server running in the background, just in case Windows 2000 totally dies, won't load or doesn't recognize the integrated network card?

Network managers, learn NetWare 5. It is very stable, and I believe it will show a strong resurgence if Windows 2000 has some flaws.

Microsoft, forget about the pre-Y2K deadline and let us network managers get through Y2K without pushing Windows 2000 down our throats. Make sure that 2000 works on all servers that are sold. Please make sure that if NT 3.51 has to be upgraded to NT 4.0, people are able to get copies of NT 4.0 easily.

A final warning to Bill Gates: Those of us who are experienced in NetWare and NT will definitely jump from NT to Novell in a heartbeat if you deliver a flaky network operating system that starts kicking people off, corrupting databases, etc. You may have the desktop world in the palm of your hand, but you still don't own the network world.

Kelly Wilke
MIS manager
Direct Communication Systems
Kalispell, Mont.

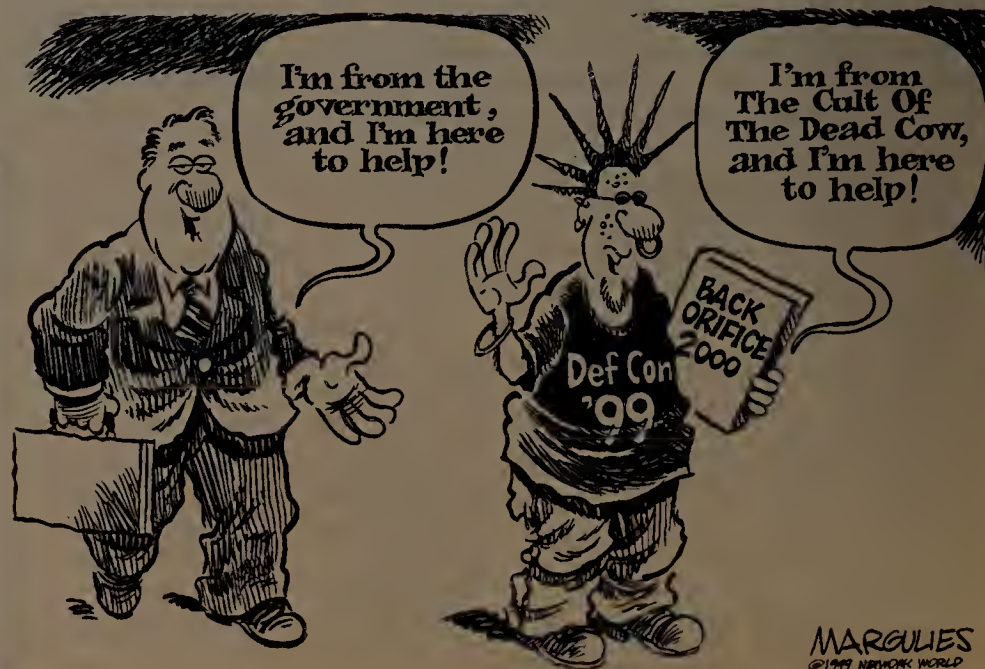
Send letters to nwnews@nww.com or John Gallant, editorial director, *Network World*, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

More
Online

- Letters about service-level agreements and other topics.

FIND IT **3940** ON FUSION

www.nwfusion.com



IT HELP DESKS FIND SALVATION IN E-SUPPORT

At one time, customers had little direct interaction with companies' network and IT infrastructures. Today, mobile workers, business partners and customers enter your firm through the e-lobby. Delays, outages or other problems are clearly visible outside the organization.

Meanwhile, computing continues to grow more complex. The proliferation of loosely connected laptop computers for an increasingly mobile work force makes internal computing environments more volatile. E-business initiatives target customers beyond the boundaries of IT's control. Knowledge workers depend on strategic business information contained in enterprise resource planning systems and data warehouses. And end users are demanding alternative communications channels into the IT service desk — such as e-mail and the Internet — rather than being forced to use the phone.

These problems have put a spotlight on the IT help desk. For help desks, the challenge is to rework support processes and service-level agreements to handle increased call volumes and problem complexity with-

out incurring runaway costs. Traditional help desk products are fast being eclipsed by emerging e-support offerings from vendors such as Motive Communications, Perpetual Systems and Tioga Systems.

Motive Communications (www.motive.com) is a proponent of support-chain automation, which uses the Internet to link end users and the digital devices they use with support organizations, vendors and shared support content. Motive's approach combines automation software (Motive Duet) with active content (Motive ActiveLink) — information that has the intelligence to identify problems and perform support tasks.

Earlier this month, Perpetual Systems (www.perpetual.com) began beta-testing EZdesktop.com, which is billed as a "conflict-free" application management system. The system provides access to a customizable database of "golden" configurations — application and operating system combinations that are known to be free of conflicts — over the Web. The idea is that avoiding conflicts will reduce the number of support calls.

And last month Tioga Systems (www.tioga.com) released Version 2.0 of its Healing System, which lets IT help desks provide real-time Web-based support. Healing System uses Tioga's DNA Probe technology to automatically determine the complete detailed configuration of any Windows 32-bit application. The DNA for any one application will differ for each end user's desktop because each has unique settings, bookmarks, proxies, plug-ins and so forth.

It goes without saying the help desk offering that's best for you will depend upon the specific policies, priorities and problem to be solved. First and foremost, remember to define and carefully articulate your requirements before bringing in vendors. Otherwise, you risk selecting a feature-rich product that may not fit your organization or solve your problems.

Ptak is vice president of systems and application management at Hurwitz Group, a Framingham, Mass., analysis firm specializing in strategic business applications. He can be reached at rlptak@hurwitz.com.

ARE THE BANDWIDTH-RICH DIFFERENT FROM YOU AND ME?

Twenty years ago I used to bemuse audiences on the rubber chicken circuit by talking about a Brave New World where computing would be free and bandwidth unlimited. (The industry was not ready for a Technology Communist, even one with a Harvard Business degree.)

This was at a time when computing cost about \$1 million per mainframe MIP and most people thought you would fall off the earth if your modem ever went faster than 2,400 bit/sec.



I would talk about home bus standards where your coffee maker would talk to your bathroom scale and your car would continuously test itself and schedule an

appointment with the nearest garage if it was ailing.

Well, if you wait long enough, everything happens (except the Red Sox winning the World Series). This year there will be 1.25 million U.S. homes (out of 102 million) that will have either cable modems or digital subscriber line. Seven million U.S. homes will have high bandwidth by 2002 and probably 10 million by 2004 — or 10% of the U.S. homes. We have become bandwidth junkies, addicted to higher speeds. What we have at the office, we will demand at home.

Two weeks ago, I was out seeing Brother Bill Gates at Microsoft and asked what kind of high-speed connection he has at home. The answer: a T-3, with a couple of T-1s for backup. Well, does that mean that someday everyone is going to have that kind of bandwidth to his or her homes? If Brother



Bill is spending three ten-thousandths of his net worth on home networking, what does that work out to for you?

And then what happens inside the home? Right now there are four home-networking standards groups: the Home Phonline Networking Alliance, which is working on phone-line networking standards; the HomeRF Working Group, which is focusing on wireless standards; the Home Audio/Video Interoperability group, which promotes middleware that allows all the audio/visual equipment within the home to communicate; and the HomeAPI Working Group, which is working on programming interfaces that enable software to discover and control home devices.

So, who wins? My bet is on the wireless network group. I think we are about to see a need for shrink-wrapped solutions that find each other, then build a network by themselves.

In other words, the home of tomorrow will be a network of networks. Every device in the home that costs more than \$25 will eventually be hooked to the Internet and yes, your coffee machine will talk to your computer and your

computer will check your flight schedule and download a picture of your driving route in that distant city. But not just a picture — a moving video of where and how to turn, all downloaded to your PalmPilot MCV.

We have always viewed the home in passive terms — as a sink of bits rather than a source. We send a low-bandwidth message upstream and receive tons of bits downstream. But that stops when the home becomes a source of significant bandwidth, too.

Think what went on in corporate networks. High speed wasn't caused by single demands for video but rather a plethora of devices on LANs. Exactly the same thing is going to happen inside the home. Your home is a LAN and so is your car. Some of those devices will require low speed, some higher.


Now, what will we Americans pay for this? ("I thought you said it was free, Howard.")

Funny thing about money. We will scream like fools if our newspaper goes from 35 cents to 50 cents per day. We will threaten to call the FCC if pay phones go from 10 cents to 25 cents. But we will defend to the death the right to pay \$40 more per month not to have to wait 5 extra seconds for Internet access.

What will we be willing to pay for bandwidth inside the home? My guess is \$120 per year — or \$10 per month for all devices. Can the industry deliver up this number? Bet on it.

Anderson is founder and president of The Yankee Group, a consultancy in Boston. He can be reached at banderson@yankeegroup.com.

FRANCIS BLAKE



Is a space-optimized
server that requires
more than these five
tools truly optimized?

It's not surprising that the interior of the Compaq ProLiant 6400R is entirely tool-free. After all, like every ProLiant server, it's been designed with customer input from the very start. With maximum 4-way computing power in just 4U, and comprehensive reliability features for maximum uptime, the ProLiant 6400R

is just what you've come to expect from the leader in rack servers. And with handy features like top and side access panels, a unique cable management arm and simple slide-out rails, it's exactly what your data center needs. Let the unsurpassed server experience embodied in our ProLiant 6400R give you a hand in solving your business IT problems. www.compaq.com/hand



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- Innovative, modular 4U design (7")
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- 64-bit PCI
- Compaq Insight Manager



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SERIES

CELEBRATING
YOU



Have you ever stopped to wonder what it would be like to manage a

network in some far-off place? Or wondered what other people in your profession do for fun? Perhaps your musing tends toward the more business practical, like whether you're being paid competitively.

Helping you find answers to questions like these calls for a special issue — The You Issue, a Signature Series supplement focused exclusively on you, the *Network World* reader.

For this issue, we polled thousands of you through two online surveys and our annual salary survey. We asked you about the consequential (how much you earn) and the trivial (whether you prefer Pepsi or Coke). These fun facts are sprinkled throughout the pages, with many featured as "marginalia" — be sure to take a look, you'll find some real gems!

And, of course, we've interviewed scores of you to find out about the big technology and management challenges you face. We also talked to you about your hobbies, your philanthropic pursuits and the unusual places you work — Senior Editor Julie Bort even ventured to frigid Arctic Quebec on one assignment.

In all, you'll find a fresh perspective on your jobs and careers in these pages. Who knows, after reading about your future in "Your life in 5," maybe you'll decide to pursue that MBA you've been hemming and hawing over for the past dozen or so years.

We hope you have as much fun with and gain as much insight from this issue as we did while putting it together. You are an interesting bunch.

Beth Schultz
Executive editor,
Signature Series
bschultz@nww.com

The You Issue is one of six bimonthly special supplements providing insights, opinions and information on the biggest trends shaping the networked world. Look for the inside stories on the most overhyped network technologies and topics in the next installment of the Signature Series, *The Buzz Issue*, coming in Sept. 27.

Leaning against an Inutsu, a human-shaped cairn on a hill above Kuujuaq in Arctic Quebec, David Birch contemplates his work as network manager for an Inuit regional government.

HEIKO WITTENBORN

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Our 1999 Favorites & Greatest Survey shows what you like best.

You online Visit our special Fusion minisite (www.nwfusion.com/you) for more about glorious you. You'll find:

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Your take on important technologies Will broadband be more important than voice over IP in the next five years? We surveyed nearly 1,000 of you and discovered which horizon to be watching. **DocFinder: 3927**

Your network nightmares You told us some hair-raising tales of network disasters — from fires and floods to mystery bugs. **DocFinder: 3924**

Forums

You pick the winners What technology will turn out to be the most important in the next five years? Log on and share your predictions. **DocFinder: 3928**

Your tales of woe Got a network horror story? See if yours can top the tales from our You survey respondents. **DocFinder: 3929**



ILLUSTRATIONS: WOODY

You work where?

Location, location, location — for some of you, it's what the job is all about.

BY JULIE BORT
AND DENI CONNOR

Dilbert's got it wrong: All network managers are not stuffed into cubicles — and our extended search proves it. We surveyed thousands of *Network World* and *Network World Fusion*

readers to find those of you who work in unusual places.

Here you'll find three of our favorites. The first is the regional government of Arctic Quebec's IS manager, who commutes to work on a snowmobile and services isolated communities via a twin-engine prop plane. The second is Breckenridge Resort's network manager, whose office window looks out onto downhill skiers carving S-turns. The third is an on-the-go military man who has crafted a WAN designed to be used anywhere — literally — in the world.

Choosing these three wasn't an easy task. They competed with hundreds of other prospects: network managers who work in flight-simulation facilities, radioactive chemical factories and NFL sports arenas, to name a few. It all goes to show: You're a fascinating bunch.

North star



The vastness of the Arctic exerts its own magnetic pull. The longer you're exposed to it, the more you feel its tug. It's an invitation to come learn the ways of the North's people, the Inuit, and plunge yourself into the wilderness, eat from its abundance, and sleep under its magical Northern Lights.

Certainly, David Birch, aka the Computer Guy of Nunavik, feels the attraction. "There is nowhere on Earth where I'd rather be," Birch says, shaking his head earnestly while

speaking of Kuujuaq (pronounced KEW-ju-ack), the largest city in the Nunavik region in Arctic Quebec. "It's the people and the land."

Figuratively, Kuujuaq is the center of a cross, a place where contrasts meet. Despite its isolation from the south — about 895 miles from Montreal and only accessible by plane — Kuujuaq is a modern city, a testament to the adaptability of the Inuit. With a population of 1,800, it is the largest Inuit settlement in the region. It sports three grocery stores, a hospital, a recreation center, TV and FM radio stations, multibedroom homes with cable TV and microwaves, and many an Internet connection. Astounding for a people who, a mere 50 years ago, lived in igloos.

Yet, the Inuit preserve their traditional ways. They teach Inuttitut as a first language, they hunt and fish for much of their food, they respect their elders, and they practice the first law of living in a harsh, unforgiving envi-

ronment: Love thy brother. The combination of modern and traditional is summed up in the Inuit yin and yang: "nunanimmi" (community life) and "maqaivvimi" (life on the land). They work in the city and flee to the wilderness for camping in their time off.

Likewise, Kuujuaq is at a physical crossroads. It's at the center of Nunavik, which stretches north from the 55th parallel to nearly the 63rd, across 200,000 square miles of usually frozen land.

Because Kuujuaq is on the edge of the Arctic tree line — even a few miles north of town the land bears no trees — it has a ripe summer season in which temperatures average 55 F. Snow melts, ice turns to streams and lakes, grass greens, berries blossom. The nearby wilderness supports a breathtaking combination of dwarf spruce, birch and willows, and for hundreds of miles the ice on the tundra gives way to green, white and red moss and lichen. On the summer equinox, the sun shines some 21 hours per day.

Nunavik (which means "a place where you settle") is not to be confused with Nunavut ("our land"). The latter is the Inuit territory created by Canada in April; its boundary starts west of Nunavik. In contrast, Nunavik's Inuit regime, the Kativik Regional Government (KRG), has been around since the mid-1960s.

A department of one

Birch is the KRG's IS department. He handles a 23-server, 21-router network that links about 700 workstations across thousands of miles.

That network supports six agencies for 14 Inuit and three Cree Indian communities. Agencies include police, social welfare and legal. Across agencies, the KRG has a dozen different departments, such as purchasing and accounting, all of which are Birch's responsibility. Likewise, the bank, the Inuit landholding organization, the major airline (First Air/Air Inuit) and 98% of small businesses all ask for help from time to time. As the

UNUSUAL WORKPLACES
and jobs mentioned by
You survey respondents:



"MY SIDE JOB is driving a semi (local and in the region). It's just a nice break from the rest of the work world."

Brian Pedersen, team leader, McHugh Software



"I LIVE AT LAKE TAHOE, CALIF., about 5 miles from Squaw Valley! I am a telecommuter, designing routed frame relay networks for a large telecommunications company . . . I usually have to provide a snow report along with my design recommendations."

Rachel Hudson, senior network systems consultant, International Network Services



FISHING WITH A "KAKIVAK"
spear is just one of the many skills David Birch has picked up since becoming IS manager for Arctic Quebec's Inuit government.



"IT WAS MORE OF AN UNUSUAL second workplace. I used to work New England Patriots football game security on the weekends."

Brian Muolo, computer specialist, General Services Administration



"I HAVE THE PRETTIEST computer room — painted purple!"

Anonymous

AND THEN THERE ARE THOSE of you who have never worked outside of this business:



"I'VE BEEN IN THE IS/IT industry 30 plus years."

Allan Hall, president, Global Network Consulting Group

sole network guy, the gregarious Birch is PC technician, network designer, network administrator, e-mail administrator, buyer, the whole help desk and more.

But he's up to the task. A former independent network consultant, Birch has a broad technical background ranging from the sciences (physics and molecular biology) to certificates for Intel processors, Xerox repair and network equipment. He's as comfortable soldering several crashed Iomega ZIP drives to form a single working unit as he is setting up a secure server to give Web access to the legal department.

Moreover, he understands how important his work is. The network is one of the area's prime communication tools, and Birch wants it tuned to do even more.

"My vision is a completely integrated regionwide network that is distributing information to the people who really need it — the Inuit — in their own language," he says.

Specifically, he would like to build a star network that aggregates applications and databases by topic rather than community. The benefits could be tremendous. For instance, a single regionwide e-mail system could be programmed to alert search-and-rescue personnel remotely.

"If we were able to have a highly reliable network, a lot of tragedies could be avoided. Right now, getting a search team is done by shortwave radio. This is the North. Radios don't work well here, unless it's a very clear day. It can take hours to round people up," Birch says.

WHAT STRIKES TERROR
in your hearts? Go online to read about
the worst network nightmares experienced
by You survey respondents.
DOCFINDER: 3924

Likewise, a single database for the renewable resources department would offer applications to serve the people better.

For instance, each community is allowed to hunt 15 beluga whales. With centralized management, a smaller community that needs only six whales can donate its remaining nine to a larger community, which may need those allotments to avoid starvation.

Such plans are a very Inuit way of weaving the modern world into a traditional lifestyle, although Birch wasn't born to the Inuit. Raised in Montreal, he moved to Kuujuaq in 1992. Today, he's not only Nunavik's technical guru, but an accepted member of the community, happily married to an Inuit woman and father of two children who are being educated in the traditional ways.

"I love the lifestyle. If I have an extremely stressful day at the office, I can walk 15 minutes and I'm in the middle of the wilderness. In the summer, I can sit on a rock and listen to the birds. In the winter, everything is white and pure. It's beautiful, cleansing," he explains.

Infrastructure shortcomings

But if the wilderness is his greatest personal joy, it's also his professional bane. The obstacle is infrastructure. While the cities have paved streets, between communities lies ice, rivers, lakes and mountains, not roads. When not in Kuujuaq, Birch can be found in a tiny twin-engine prop plane — the only access to the far-flung communities he supports.

Also absent are high-speed telecommunications. Within towns, Bell Canada offers 56K bit/sec plain old telephone service, but between them it only has 16.8K bit/sec satellite connections. "My main problem is slow-speed access to the rest of the planet," Birch says, frowning.

Not that it can't be done. For instance, the separate federal hospital system uses T-3 circuits between its Nunavik sites, one of which is down the road from the KRG building in Kuujuaq. But because of security concerns, Birch has yet to get permission to piggyback his datacom traffic onto that nice fat pipe. ISDN is available in Kuujuaq, but it is too costly for the KRG.

Still, Birch is a man who's seen many of his dreams realized and brought his community far into the technical age already. He's upgraded the KRG from the Apple LocalTalk network and nine ancient Macs it was using in 1992 to today's TCP/IP, 10/100 Ethernet network featuring Bay Networks routers, Windows NT Server 4.0 and several Pentium or PowerPC machines in every community.

As the Inuit say, "sivunivut niriunniqatsiapuq" — the future is full of hope.

— Julie Bort

Network mogul



They call it white gold, Colorado powder. It's snow so dry that you can scatter a 3-inch accumulation with a strong puff of breath. It's the ultimate downhill experience: soft and responsive. Fun? Sure. Also big business. Colorado powder calls 19 million people annually to the Rockies, more often than not to Breckenridge Ski Resort.

There, in a small administrative building on pine-covered Peak 8, is Ben Gilling's office. Gilling is the senior network specialist for Vail

Resorts, Inc. (VRI), Colorado's largest resort operator, owner of Breckenridge, Beaver Creek, Keystone and Vail.

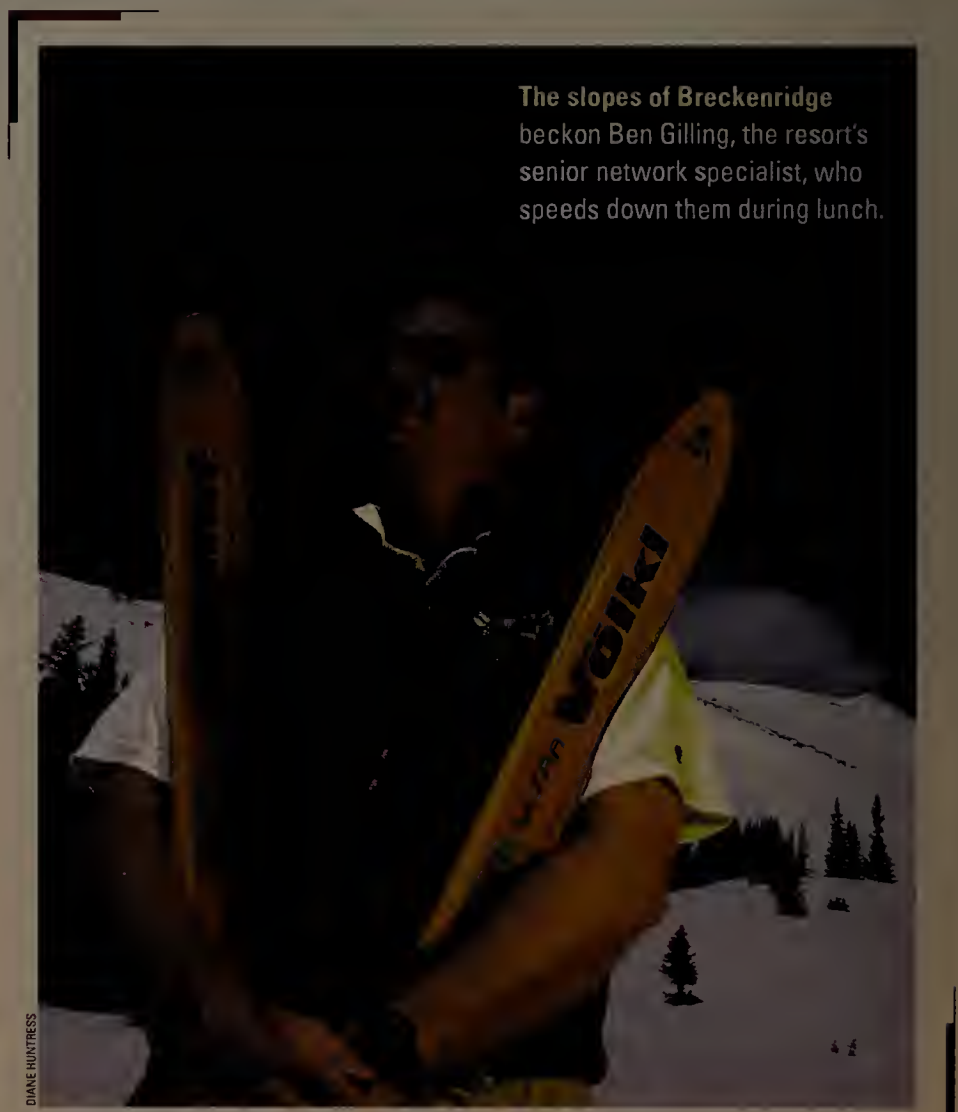
His desk butts up against a picture window that frames the Colorado Super Chair lift and snakelike skier traffic of Breckenridge's Crescendo and Springmeier runs. But on most days, you won't find the 6-foot-tall, athletic Gilling at his desk. He's out tending the switches at one of the resort's 20 networked locations or, if it's snowing, he's on the slopes.

"Skiing on a great powder morning is nirvana. One of the great perks of my job is that I can take advantage of that," the 34-year-old says in an even, thoughtful voice that reverberates slightly with a Kansas City twang.

Pass the credit card

Gilling's is a job that has it all: intense beauty, incredible year-round perks and a state-of-the-art switched network packed with challenges.

The VRI network spans more than 100 miles, from Denver to Avon, a city just west of Vail. Gilling is responsible for the Breckenridge arm, a complex mixture of wireless technology, more than 40 Novell servers on switched Ethernet LANs (plus three IBM AS/400s) and various WAN services, including ATM, frame relay and T-1.



The slopes of Breckenridge
beckon Ben Gilling, the resort's
senior network specialist, who
speeds down them during lunch.

ODD SPOTS Managing networks has taken some of you to places you'd likely never see otherwise, such as:

- The front lower lobe of a Boeing 747
- The Aswan Dam
- Offshore oil rigs
- A steel plant's outbuilding in the middle of nowhere

BEFORE NETWORKING Here are some of the fields you've worked in prior to getting into the network world:

- Accounting
- Broadcasting
- Electronics
- Financial services
- Music
- Programming
- Sales
- Commercial real estate



And the odd jobs you've held:

- Paperboy
- Pizza chef, pizza delivery
- Car washer

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No matter how daunting your company's network security challenge, there's an OPSEC solution to help you meet it. For more information, including downloadable evaluation software and a complete list of OPSEC partners, visit the OPSEC website at: www.opsec.com/integration

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"One of the biggest misconceptions people have about my job is that it's Podunk. That's not true. Our network is as sophisticated as any Fortune 1000 company's. We have a switched platform and a 100M backbone between products," he says.

More than that, the network is Breckenridge's financial lifeblood, controlling ticket sales, the ski school and restaurants. It also handles some rather sophisticated applications, such as a system that turns a season pass into a credit card that guests can use to buy food and goods at any VRI resort, or the wireless ticket validation service used by ski lift operators.

Another misconception Gilling finds is that he has summers off. It's really quite the opposite. As cold gives way to warmth, skiing gives way to mountain biking. At Breckenridge, guests use the lifts to take their bikes to the top and ride the steep grassy slopes down. Last year, Breckenridge even hosted televised downhill races for the National Off-Road Bicycle Association.

Breckenridge also opens a "summer fun park," which has an Alpine slide, a maze and miniature golf. All need the network for ticket sales and tracking.

Spring is all the time Gilling has to plan and test new projects. With the fall comes 12- to 16-hour days of getting ready to receive the winter guests. Those long days are filled with implementing and testing all major switch, cabling, server and wireless upgrades — not to mention bargaining with US West, the only infrastructure vendor serving the mountains.

Downhill desires

Still, the serious and confident network manager says, this was a job to which he aspired. Five years ago, he left a high-paying sales engineer position at a Houston system integrator and headed for the mountains. He worked for a year at a low-paying front-desk position before landing in MIS as a PC technician. From there, ambition and good ideas moved him steadily up into network management.

"I'd describe myself as a corporate dropout. I wasn't really satisfied with the work I was doing in Houston. It has always been a dream to live in the mountains and be a ski bum. Vail is still a large corporation, so we have a corporate environment, but with a mountain twist," he says, smiling.

— Julie Bort

Moving man



The hot desert wind is blowing at 45 mph, whipping up sand and dirt. Visibility is 50 feet, and a haboob — the weather condition the Bedouin call the "worst possible of things" — is bearing down fast. It's a brown thunderstorm that showers walls of mud-laden water as it passes.

Imagine, as Sgt. 1st Class Kevin Young has had to do, what it would be like to build and maintain a WAN that could operate in such an environment — actually, in any environment, anywhere in the world. That's

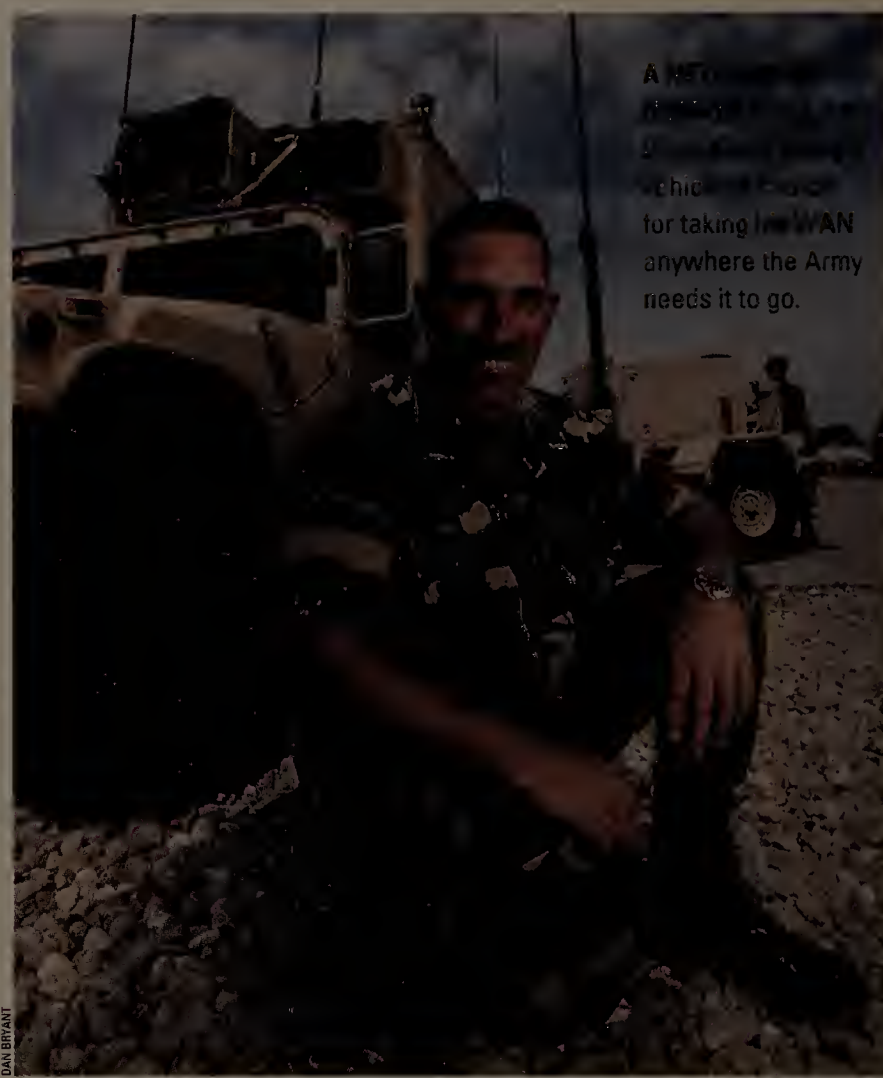
just the assignment the Army two years ago handed to Young, who had gained some network experience while serving for 15 years in Special Forces and light infantry. His specific marching orders were to put together a network for the 4th Infantry Division, 1st "Raider" Brigade that could be set up and configured easily, and torn down just as quickly when ground troops moved to new battle positions.

The WAN would be part of the Army's Force XXI war-fighting experiments to improve battlefield performance with digital technology. And it would ultimately be used in combat.

After getting this assignment, Young gathered together 13 other enlisted men and women from the Raider Brigade. The team, with the assistance of government contractors such as Mitre, came up with a network designed for quick assembly and disassembly.

The WAN is ready for action. And here's how it will be set up, whether running on base, in the field for training exercises or at the battlefield.

Central to the design is the LAN Management Vehicle (LMV), a Humvee out-



fitted with a Sun SPARC-20 server and up to 125 case-hardened Unix workstations connected with 10M bit/sec Ethernet. These machines are joined to workstations in other vehicles via Cisco routers and coaxial or fiber-optic cable, forming a WAN that covers a swath of land 37 miles wide. Another WAN, similarly configured, takes over control of the next geographic location. The WANs are all linked.

Each workstation on the WAN performs a different task. Some display maps for determining troop positions. Others track weather or enemy troop movements. Still others take satellite information that will be used to tell tanks what to do. Each vehicle contains a similar setup.

High-tech battlefield

In battle, the WANs will be situated in the rear under camouflage tarps. Vehicles equipped with LAN equipment at the front will transmit troop positions, report enemy fire or call for help to the main WANs via two-wire X.25 or radio links. Using information coming into the WANs, brigade commanders will direct operations, attacks and troop movements.

When the troops move, so will the WANs. That will mean closing down all LAN applications, severing the WAN connections, coiling the cable and falling in line behind the advancing tanks. At the new position, the WAN will need to be re-established at once. Young says training exercises have shown that it takes 24 16-oz. cans of compressed air per day to keep the WAN equipment clean.

"The WAN will be the heart of the whole operation," says Young, with an accent particular to this area of central Texas. "That's why it's so important that my guys have to be good at what they do. They have to be able to troubleshoot something in their mind, know what it is and get it fixed, up and running — now."

In his office at Ft. Hood in Killeen, Texas, the country's largest Army base, Young sits in fatigues, looking comfortable in the 90-degree heat as he talks animatedly about the WAN. The 46-year-old is a mixture of genteel Southern gentleman and a down-home good ol' boy, comfortable fiddling with computers and building Web pages.

"You have to have it in your heart to do things like this," says Young, who passed up retirement so he could get his replacement trained.

— Deni Connor

A WELL-TRAVELED BUNCH A number of You survey respondents said they've been dispatched to foreign lands to work on network projects. Destinations include:



- The Caribbean islands
- The North Sea oil fields
- Saudi Arabia
- Southeast Asia
- United Arab Emirates

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Prepared by The Silicon Valley Networking Lab (www.svnl.com) and available at www.svnl.com/test_lab_reports.htm.

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What you make

Our 1999 salary survey shows a big hike in compensation while revealing a startling disparity between male and female pay.

BY LYNNE CASTRONUOVO
AND SUSAN ELLERIN

Jonathan Weinberg is one happy network professional. His base salary jumped 9% from \$110,000 to \$120,000 this year. And by the time he collects an expected \$30,000 in bonuses, his total 1999 compensation will hit \$150,000, an 11% increase over salary plus bonuses last year.

Weinberg, 30, manages about 25 employees as director of technical services at Baseline Financial Services in New York. While the five-year veteran of the firm realizes it's an opportune time to job-hop, he enjoys his work and is happy staying right where he is.

His pay raise would be the envy of most U.S. workers, whose average weekly earnings rose a modest 3.2% over the past 12 months. But the IT job market is so hot that Weinberg's percentage increase is actually below that of many of his peers.

The 1999 Network World Salary Survey shows that total compensation rose an impressive 18% this year. Total pay jumped from an overall average of

\$63,050 in 1998 to almost \$75,000 in 1999, according to respondents' estimates of the bonuses, stock options and additional pay they will amass before the year is out.

The survey focuses on salaries for senior network executives, LAN/WAN management, other network management and network staff. Senior executives' total compensation increased by 24%, LAN/WAN managers' by 9%, other network managers' by 10% and network staffs' by 16% (see graphic, left).

Base salaries increased by almost 14% in 1999. Average salaries range from about \$56,000 for network staff to more than \$76,500 for senior network executives. A full 46% of respondents

receive bonuses, stock options or other salary enhancements; only 40% earned these extra benefits last year.

Not only are more network professionals receiving additional sources of pay, but these monies account for greater proportions of overall compensation — 15% today compared to 12% in 1998 (see graphic, right).

Big companies, big pay

We examined relative compensation levels in three types of companies — those with fewer than 1,000 employees, those with between 1,000 and 9,999, and those with 10,000 or more. Larger companies typically offer higher salaries (see graphic, page 46).

But in an increasingly tight labor market, it is perhaps not surprising to see smaller firms making a valiant effort to catch up by consistently giving higher-than-average salary increases than their larger counterparts. While fewer smaller firms distribute bonuses, those bonuses tend to account for a greater portion of employees' overall compensation.

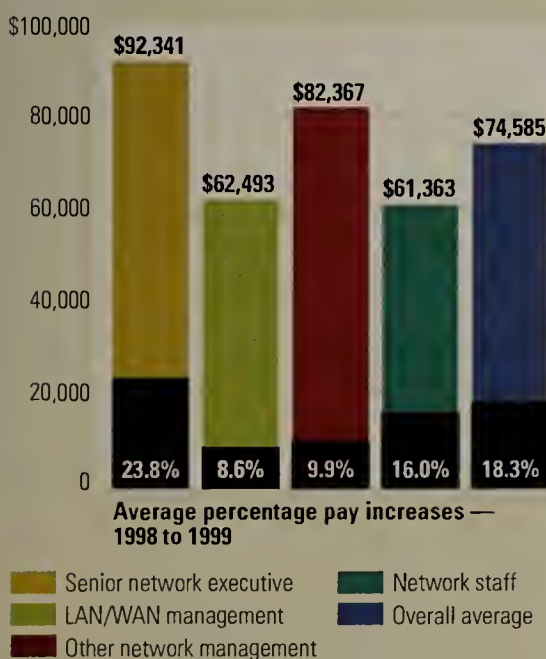
Just as in 1998, regional salary differences are apparent, even when company size and titles are constants. On average, network professionals in the mid-Atlantic region command significantly higher salaries than their counterparts in other areas of the country (see graphic, page 50).

Regardless of location, the IT labor shortage is obviously having an impact on job offers. Those who have worked for their employers for just a few years attract relatively higher salaries than those who have tenure.

"Companies are in a bind. On one hand, they can't afford to lose the See **Salary**, page 50

PLENTIFUL PAYCHECKS

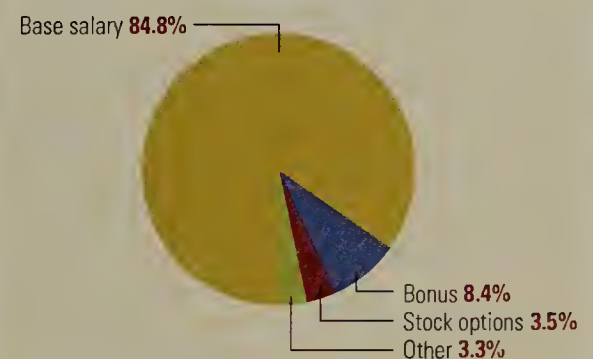
Here's how much you expect to earn in total 1999 compensation, including base salary, bonuses, stock options and all other pay.



NOTE: The overall averages presented in this and the following charts reflect weighted calculations that take into account the number of respondents for each category.

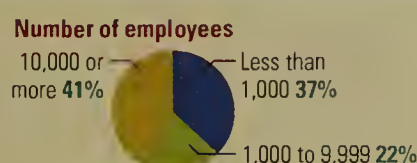
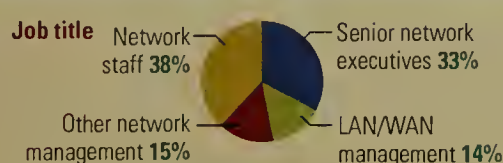
COMPENSATION COMPONENTS

Those of you who earn more than base salaries are bringing home a good chunk of your total compensation in the form of bonuses, stock options and other forms of pay.



SNAPSHOT OF SALARY SURVEY RESPONDENTS

Here's a breakdown of our salary survey respondents by job title, company size and industry:



SIZE MATTERS

Those of you who work for large corporations generally earn more than network professionals who are employed in smaller firms. However, small firms usually award their IT staffs with more generous raises and bonuses than their larger counterparts.



Shortchanged by sex

BY NEAL WEINBERG

Suzan McAllister didn't get any fat bonuses this year — no stock options either. She received a modest 4% raise that brought her annual salary to \$30,000.

But McAllister, network administrator and PC lab manager at Lake Superior State University in Sault Ste. Marie, Mich., isn't complaining. She's seen worse.

In her prior job, she was a full-time network manager and database administrator at a public school system in a small town in Michigan. After five years on the job, she was only earning \$10,000 for the academic year.

As if that wasn't bad enough, a male co-worker who did the same job and had been in the school system for only 18 months was earning \$24,000 per year. McAllister says the school administrators gave him all the credit, despite even his efforts to point out her accomplishments.

She's not alone in the perception that gender has worked against her when it comes to compensation. And the numbers back her up. Female network professionals earn 72 cents for each dollar earned by their male counterparts, according to the 1999 Network World Salary Survey (see graphic, below).

Men are earning an average of \$67,237 in base salary and \$77,322 in total compensation this year, while women are only bringing home an average base salary of \$51,789 and overall compensation of \$55,596 in 1999.

Sherri Zickefoose is a 26-year-old systems administrator at Gerber Industries Ltd., a Phoenix company that imprints logos on items such as plastic water bottles. She works in a three-person department alongside a man who essentially does the same job she does.

Zickefoose earns \$29,000 per year, while her male co-worker earns more than \$40,000 per year — and he started after she did. The only difference is that she learned on the job, while he has Microsoft Certified Professional certification. "If we're accomplishing the same things, then I

would think it would be equal," she says. But it isn't.

Zickefoose says she has mentioned the disparity to her bosses and has been told that she's getting good experience and that she shouldn't complain too loudly.

One female network administrator who didn't want to be named says she and her husband hold bachelor's degrees and do the same job at different companies. She makes about \$14,000 less than her husband. And he works for a government agency, while she works in the private sector.

When asked to explain the wage gap, she summed it up in one word: "Genes."

Likewise, a 43-year-old woman who works at a branch office of a pharmaceutical company in the Midwest attributes her relatively low salary to gender bias.

She has six years' experience and singlehandedly runs a 133-user network. She earns \$37,000 per year and got a 4% raise without any bonuses this year. "I've been doing some research. Help desk professionals make more money than I do," she says.

The network administrator adds, "I enjoy what I do. I would love to be compensated for it." She brings the topic up with her supervisors all the time but never gets a satisfactory response.

She has flirted with the idea of looking elsewhere for a job, but she is in the midst of a Year 2000 project that involves moving the desktops to Windows 98 and upgrading from NetWare 3.12 to NetWare 5. She's dedicated to seeing the project through completion.

The gender gap in network pay tracks fairly closely to national averages. For example, women earned 74 cents for each dollar earned by men in 1997, according to a U.S. Census Bureau analysis of median annual earnings of all year-round, full-time workers.

Susan Bianchi-Sand, director of the National Committee on Pay Equity, a Washington, D.C., nonprofit organization, says this gender gap has shown up in virtually all salary studies, no matter what occupational group is examined.

The explanation is simple, she says: "The culture hasn't adjusted to the fact that women bring as much to the table as men do." ☆



Suzan McAllister, now network administrator and PC lab manager for Lake Superior State University in Michigan, says she experienced a male-female pay discrepancy at her previous network job.

PAY DISPARITY
The female:male earning ratio of pennies to the dollar isn't pretty.



Senior network executive



LAN/WAN management



Other network management

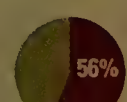


Network staff



Overall average

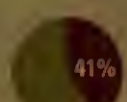
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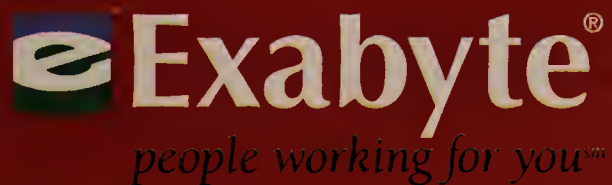
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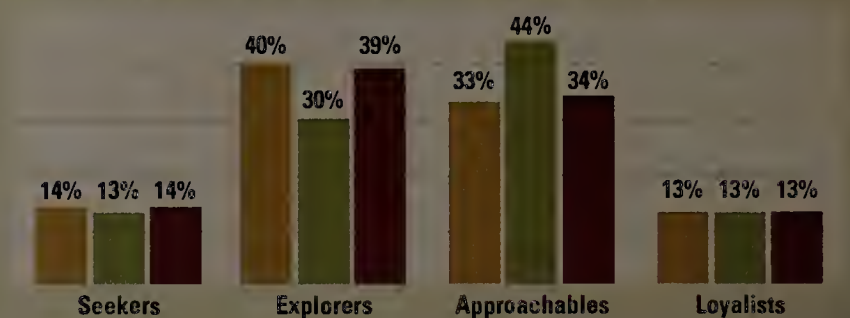
MAPPING COMPENSATION

Network professionals based in the Mid-Atlantic region made almost 17% more than their counterparts in other areas of the country.



LIMITED LOYALTY

In today's hot job market, more than half of you are seeking or exploring new employment opportunities. However, female network professionals are less likely to leave their employers than males are.



Salary, continued from page 45

people who really understand and run their systems. At the same time, they need to compete aggressively to attract the small pool of high-level IT managers," says Bruce Dorskind, president of Dorskind Associates, a strategic human resources consultancy in New York.

A gaping gender gap

The survey yielded a startling picture of the average compensation of female vs. male professionals. The typical woman earns about 72 cents for each dollar earned by the typical man — a disparity that is fairly constant across the four network job functions (see story, page 46). This large difference can be partially explained by the fact that fewer women have advanced degrees, and more work for smaller companies. However, even when we control for these variations, we find women's earning power to be much lower than that of men.

Despite their lower average pay, women are less likely to be actively looking for new employment than their male counterparts. We used STAT Resource's validated method for measuring employee loyalty to divide respondents into one of four groups depending on how likely they are to change jobs:

- **Seekers** — Actively looking for a new position.
- **Explorers** — Would follow up if they learned about an interesting job through an advertisement or another person.
- **Approachables** — Would consider an opportunity only if they were personally contacted.
- **Loyalists** — Cannot envision changing jobs in the near term.

Only 43% of the women are seekers or explorers. In contrast, 54% of the men are taking active steps to find new positions. More women report themselves to be merely approachable. About the same proportion of professionals of both sexes — approximately 13% — call themselves loyalists (see graphic, above).

These differences may reflect greater passivity on the part of women, or merely the fact that women are frequently juggling more responsibilities on the home front that would stand in the way of more active pursuit of other employment options.

Interestingly, compensation doesn't appear to drive loyalty because those who are open to new job opportunities are likely to be paid about the same as those who are not looking. Yet while compensation may not inspire workers to look for a better deal, it's clear that rich offers may cause people to jump ship when approached. For this reason, employers are focusing more on retention and ensuring that they offer competitive compensation packages and benefits.

Castronuovo is research manager and Ellerin is president of STAT Resources, a strategic research and consulting firm in Boston. STAT can be reached at www.stat-resources.com. Neal Weinberg, Network World features editor, also contributed to this story.

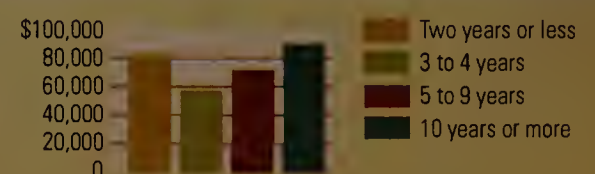
TYPICAL PROFILE

Here's an encapsulation of average overall survey demographics by gender:

	Age	Years in industry	Years in position	1999 total compensation
Male	40	8.6	4.5	\$77,322
Female	41	8.6	4.0	\$55,596
Overall average	40	8.6	4.5	\$74,585

LOYALTY PAYS OFF IN THE LONG RUN

Recently hired senior network executives initially earn higher base salaries than their peers with tenure, but this trend shifts once an executive's tenure hits 10 years.





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Your life in 5

Thriving in a network job through 2004 and beyond means shifting your skills from mostly technical ones to largely business and strategic ones.

BY JULIE BORT

E

ven as you read this, you're standing in a virtual minefield. One misstep in choosing which skills to master over the next five years and you're dead.

More dangerous still, the skills you think you need provide nary a defense. Knowing how to converge services onto a single network and manage bandwidth may make for good conversation, but won't earn you corporate kudos.

Already, casualties have been reported. A network manager is shocked to find a pink slip on his desk one day. His last review was great, and he was on track for meeting his objectives: network failures were reduced, projects were on budget, prices well negotiated. Why did he get the boot?

Some vice president wanted to standardize on Windows NT and this network manager was a NetWare proponent. Never mind that the manager had hard-earned opinions on the network operating systems (NOS).

Sadly, this tale is becoming increasingly common, says Dave Passmore, research director for NetReference, a consulting firm in Herndon, Va. "Network managers may align themselves too heavily with a vendor. The next thing you know, they've created a perception that they're biased, and quickly lose credibility and, often, their jobs."

The issue isn't which vendors are best for the company, but control. In the next five years, business practices will shift because of technology. The network's role is being elevated by electronic commerce, enterprise resource planning (ERP) and convergence. Step wisely, or you'll lose command.

Behind closed doors

While today's typical network manager agonizes over bandwidth, other less-informed people are readying to make hard-

core network decisions. Before you know it, they'll mandate voice over IP, sign ill-guided service-level agreements (SLA) or standardize on an unsuitable vendor.

So what if they don't understand what the technology can and cannot do? You could be told to make it work ... or else.

Laughing at the thought? Get serious. Blinking red warnings are flashing in front of you. How many of you swore that NT would never be your primary NOS, only to be given a mandate by a higher-up to adopt it?

That's only an indicator light. Microsoft broke ground in the way it sells Windows NT — pitching it to management. Microsoft's underlying message is that the network has become too important to be left to mere network folk.

NT's success is a harbinger. Take a look at how vendors are marketing these days. Mainstream publications such as *Business Week*, *Fortune* and *Forbes* are loaded with ads from Cisco, IBM, Lucent, Sun and others, as is prime-time TV. In print, ads are punctuated with editorial on new technologies. The bits aren't created for net managers but for all the nontechnical people who are poised to make IT purchasing decisions.

Can business people with scant technical backgrounds choose network technologies as well as you can? Surely not. No matter — it's going to happen. If



"Network managers will need a solid background in business fundamentals."

Bob Currier, director of data communications, Duke University

MINDS ON THE FUTURE

Here's a look at what emerging technologies network pundits predict will be mainstream in 2004.



"DON'T ASSUME five years from now that IP networks will be proactively managed. When you start giving carriers all the knobs and dials of QoS, it can make networks worse."

Dave Passmore, research director, NetReference



"INDIVIDUAL CARRIERS will be able, in their global, full-service form, to provide the set of services that today requires multiple carriers."

Phil Evans of Perot Systems and former ICA president

their choices turn out to be disastrous, the new marketeers have a ready answer: Replace you with the vendors themselves. Look at how many times and in how many ways outsourcing is sold in ads and articles. The same story is being told directly to your bosses, via consultants.

Replacing you with a service provider will become increasingly common, experts agree. "In the future, networks will be outsourced. The functioning of the physical layer will not be your problem," says Tom Nolle, president of CIMI, a technology assessment firm in Voorhees, N.J.

A fighting plan

So the usurpation of your decision-making power is your biggest threat. Here's a little secret: It's also your chance to rise to the top of the salary and org charts. The brass now knows the network to be the business' cardiovascular system, and that positions you to be a strategic player. Whether your career rises with the network, or you become like the copier repairman, invisible as air, depends on the action you take today.

What you need is a fighting plan. You must shift your skills from mostly technical ones to largely business and strategic ones. You need to establish political might and hang with the right people.

You must become the master network "consultant," teaching senior management about outsourcing and technology. Necessarily, you must continue to understand networking better than anyone else, but the goal of your training has changed. Your job will be educator, not implementer.

In short, how you spend your days will change drastically from July 26, 1999, to July 26, 2004.

The great mediator

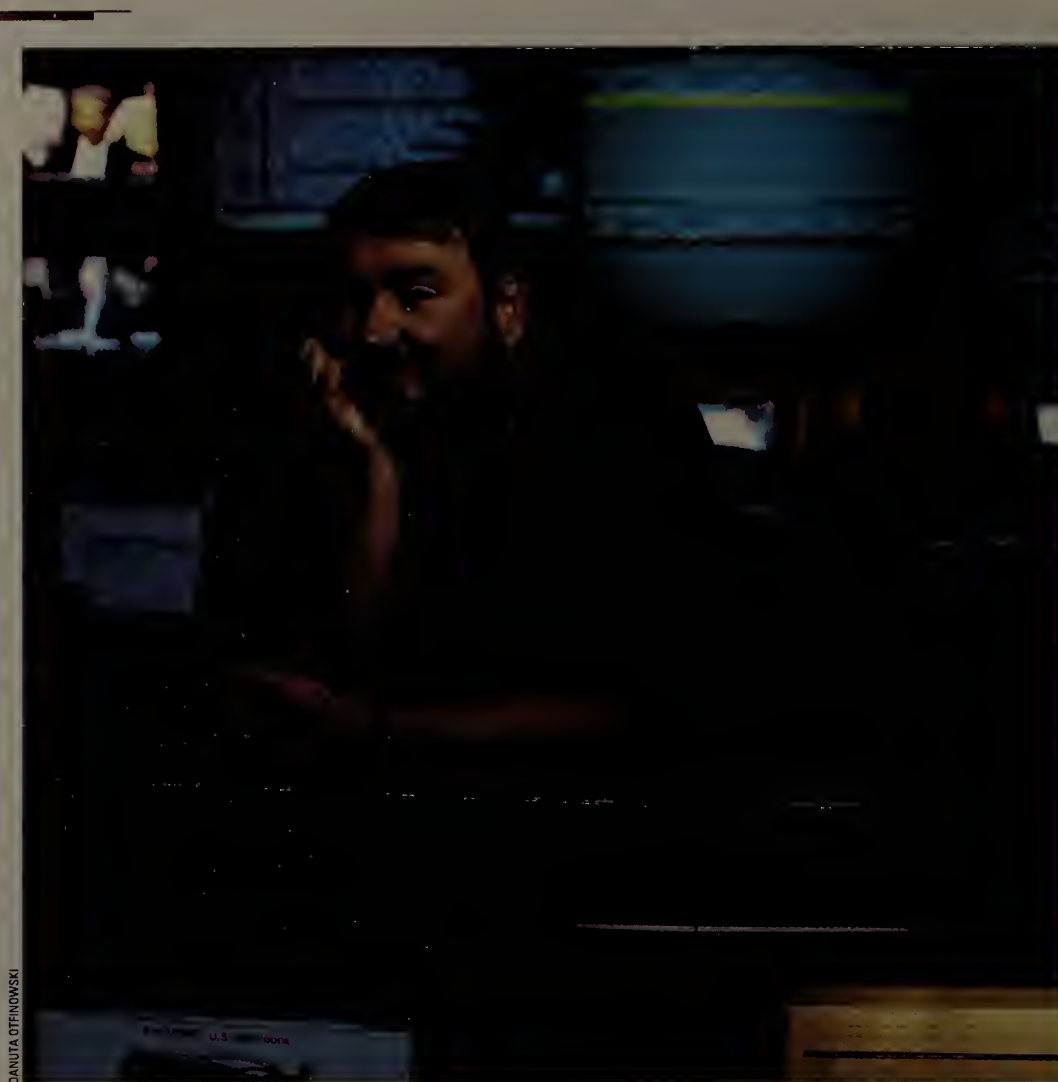
Network managers in 2004 will be doing a job that looks a lot like the chief information officer's job today. You will no longer be judged by how many packets cross the wires unharmed. You will be rated on how the network boosts business. Call yourself a network mediator — you'll turn business needs into action items for the network and then report on how business goals were achieved.

So if the chief financial officer declares that the company must invoice orders faster, you'll make it possible. You'll boost priority for fulfillment records, potentially working with accounting and application developers to make it so.

E-commerce will be a driver. As a company relies on networked systems to bring in the orders and manage the supply chain, availability will be a given, not the ultimate goal.

"In five years, instead of watching the pipe and making sure it's running, the real aspect of the job will be to analyze business flow — to offer more tracking. There's a blending between the business side and IT," says Nick Evans, technical director of PricewaterhouseCoopers' Internet Practice in Dallas.

That is, upper management will want you to translate the movement of



"Magic answers won't fall from the sky."

Michael O'Dell, vice president and chief scientist, UUNET

perform as intended. Configuring the tool becomes a technician's job, be it in or out of house.

Gaining analytical skills could require some business classes or even an all-out MBA. Courses the company offers about itself, such as the standard orientation for new salespeople, are also a good place to start.

"The network manager of the future will need a solid background in business fundamentals, such as project management, sales and marketing, as well as effective presentation skills. He can't be locked in the basement anymore," says Bob Currier, director of data communications at Duke University in Durham, N.C.

Given that the average *Network World* reader routinely works overtime, where do you find the time for this training? What do you give up?

The hard answer is to give up under-the-hood technology. Spending your days mastering a new routing protocol could be a career killer, especially if you have five-plus years' experience and a couple of certifications, CIMI's Nolle says.

Stay too close to the technology and you'll find yourself more desirable at a carrier or a consulting firm than in an enterprise setting, says Cheryl Currid, president of Currid & Company, an IT consulting firm in Houston. The technology-oriented who want enterprise ties will have to find skills other than networking to make a living. "They may take on an application focus: databases, e-commerce or capacity planning," she says.

Scarier still, people who will have invested 10 years or more in a career by 2004 face rampant age discrimination in these hard-core technology positions (*NW*, Sept. 14, 1998, page 1).

If this seems like the kind of pompous air O'Dell wants you to dismiss, consider that organizations with cutting-edge networks are also proponents of this "business network manager" breed.

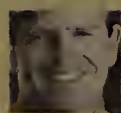
"In smart organizations, the network is seen as critical. In these places, soon you'll see the job transformed. Network managers will have to learn more of the business side," says Joe Mambretti, director of the International Center for

packets into business information. Instead of telling who is sending the packets from which applications, you'll be drawing the big picture for management. What does network activity say about customer habits, supplier needs and interdepartmental shortcomings? It'll be like ERP on steroids.

You need two types of know-how to change from a packet watcher into the great mediator. One is analysis; the other is political.

To gain the former, turn critical thinking into an art, advises Michael O'Dell, vice president and chief scientist for UUNET in Fairfax, Va. "When people send out data sheets or when you read articles in the press, you've got to know which are pompous air. . . . Magic answers won't fall from the sky," he warns.

As an example, O'Dell offers up the area of policy-enforcing technologies, be they firewalls or the promised policy-based network management systems. The skill needed is the ability to figure out which services need what level of protection, then develop enforceable policies that



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Peter Wagner, general partner, Accel Partners



Jim Herman, vice president, Northeast Consulting

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Advanced Networking at Northwestern University in Evanston, Ill.

He cites businesses that offer customer-support Web sites. Here, the network manager would need to coordinate net operations with product launches, for example.

Of course, this depends on hanging out with the right people.

CIMI's Nolle says: "The most impor-

tant relationship the network manager will have is with the operation planners. In every enterprise, there is a group of people who take a business problem and convert it into a project. The network manager's role will be to ensure the network's capabilities are understood in this process of conversion."

Phil Evans of Perot Systems in Plano, Texas, agrees. Evans is an illustrious net-

work visionary, co-author of the *Network Manager's Handbook* and former president of the International Communications Association, the once-ubiquitous user organization. "Spend time with the managers who are responsible for the planning and delivery of the company's business and with the major customers and suppliers of your company," he advises.

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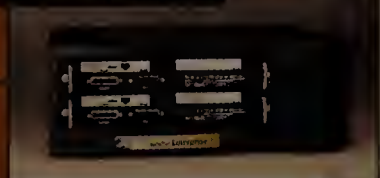
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PHILLIP PARKER

Chris Hjelm, senior vice president and CIO at FedEx, says net managers in 2004 will need an excellent set of negotiation and management skills.

Evans also recommends developing relationships with other business telecom managers and unbiased consultants and educators who have proven records for predicting technology trends.

If you hang with and gain the respect of the power executives, you won't be viewed as a low-level techie. You need to be seen as network educator, able to translate the thickest techno-jargon into the clearest concepts.

"Avoid no one, but moderate the time spent with the techies who are more interested in the engineering purity of a solution than with the business," Evans warns.

More with less

Despite the network's rising power, the net manager in 2004 will supervise smaller staffs than ever before. The talent pool will continue to be small as service providers raid from the enterprise, helping provide credence for using outsourcers. They have all the talent, they'll claim.

Yet, for the savvy business network manager of 2004, outsourcing won't be your undoing. Rather, it will augment your small staff, releasing you from your pager. In short, you'll hand off crisis management.

"Just because you've got a service provider doing some of the things for you, the need for the network manager doesn't stop. The job becomes more strategic and less daily fire-fighting," says Peter Wagner, general partner for venture capitalist Accel Partners in Palo Alto.

So when not in meetings with operational executives, a regular part of your job will be to select your company's providers — by evaluating their under-

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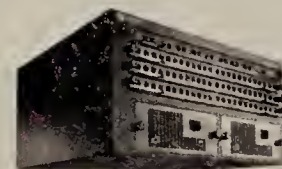


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lying technology. You'll need to maintain high-level education in emerging technologies and, certainly, security.

Ironing out a fair, executable SLA — along with a method of verifying it — is a final requirement. Ironically, the skill for this will likely have a bits-over-the-wire technical component. Tools that monitor the net for SLA compli-

ance are already coming into the market. Sometimes said to have a "service-level validation" function, these products fall under the umbrella of service-level management devices.

As you distance yourself from technology, your staffers — or even the outsourcer — will probably use such tools. You'll analyze the reports they

generate, and verify if providers are keeping promises. You'll exact retribution for lapses.

In the words of UUNET's O'Dell: "The point of SLAs is that the people don't want money back. They don't want it broken in the first place. Part of this has to do with defining the service, what it is, what it isn't, what we

do and what we don't do."

Ultimately, you will catch and fix performance problems before the lawyers are called.

Plugging the unplugged

Despite selective outsourcing, the network will continue growing. In five years, it will host dozens of services, such as IP voice and video. Network appliances, thin clients and wireless computing are also expected to be big by 2004. Consider this: Market research firm International Data Corp. projects that 721 million devices will access the Web at least once a quarter by 2003. At least one-third of these devices will be something other than a PC.

Even if you don't adopt non-PC devices strategically, you can't keep them from your enterprise; users will bring them in. Once there, you'll be expected to support them.

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Therefore, a fundamental aspect of your job in 2004 will be to master a multiheaded network that includes the entire WAN, LAN, desktops, wireless networks, personal digital assistants, Internet-enabled cell phones and Internet-specific handheld devices. These devices will need to work together. Data generated by one will need to be accessed by another. Even if you intend to outsource, you'll have to coordinate the work of a handful of service providers.

"Networking options are increasing. There's cable being used by telecommuters, all the different digital wireless stuff . . . it's still about moving bits, whether it's a wire or not," says Chris Hjelm, senior vice president and chief information officer of Federal Express in Memphis, Tenn. "Integration is a big role."

To manage the FedEx network of 2004, Hjelm says he'd want people experienced in managing global networks, particularly for e-commerce and Internet applications. Candidates should also have exposure to a variety of network technologies, including wireless; proven integration skills; knowledge of network and Internet security; and, most importantly, "an excellent set of vendor negotiation and management skills."

Adds Duke's Currier: "A manager's technology skills will require him to be a generalist and a network pathologist. [Companies will] pay you to listen to the technologies and, as systems and applications are added, understand the possible problems."

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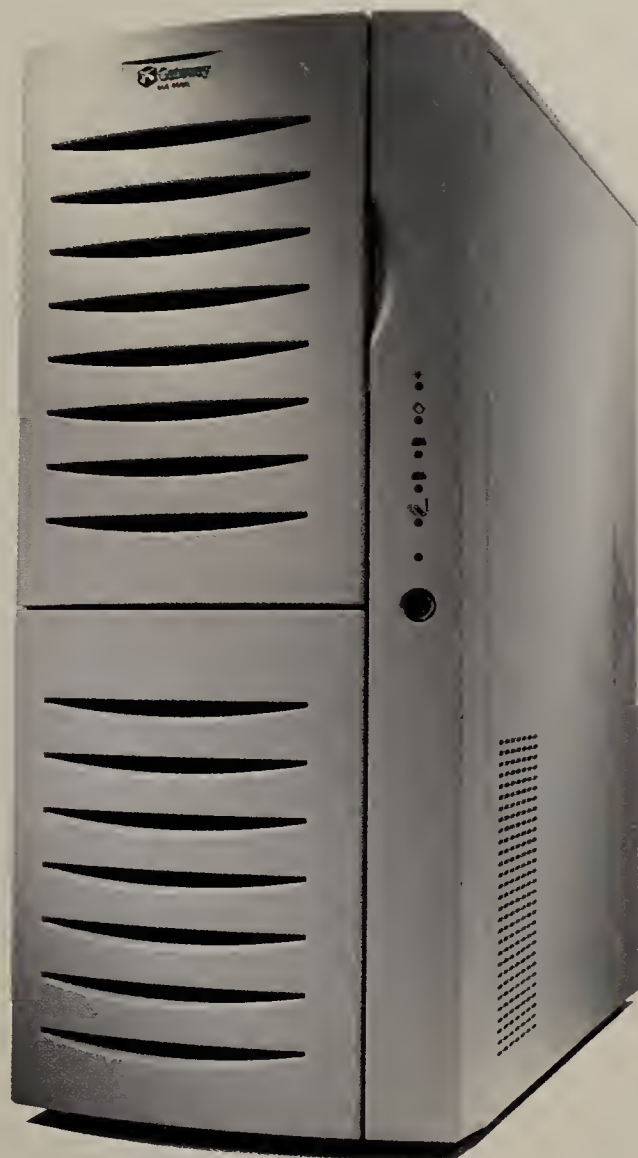
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Crazy you

We know you love technology, but your passions don't stop there.

BY BETH SCHULTZ

As twilight deepens and dusk falls upon the city, a vampire steps forth from her lair. Her plush, blood-red gown swirls about her legs as she hurries along the darkened streets. One look at her pale face, red lips and tangle of long, dark hair sends shivers down the back of the unsuspecting. What godforsaken corner of the earth loosed this wretched creature of the night?

Doubt if you will, but this mistress of the dark spends her daylight hours tending the local network at the Social Security Administration's Office of Hearings and Appeals (OHA) in Fargo, N.D. She's Trish Lewis, a *Network World* reader who is absolutely crazy about her hobby.

Lewis dons her Gothic garb to get into character for a live-action role playing (LARP) game called "Vampire: The Masquerade." Besides dressing their parts, the players use props, settings and music to create atmosphere. They play out personal story lines within a framework laid out by official storytellers.

Lewis says her love of LARPing evolves from an interest in acting and science fiction, a common LARP theme. She opted for playing a vampire rather than a Trekkie to cater to her "artsy" side, says the 40-year-old systems administrator, noting that vampire dress is more in line with the vintage clothing she favors for work.

Lewis has been LARPing for three years, mostly as a ninth-generation vampire who has Irish roots. The action takes place in private homes or public places, such as the town square or a nightclub. Lewis says it took some "chutzpah" to join her first game, the type of nerve that has served her well professionally, too.

She began work at the OHA 10 years ago in a clerical position. Six months later, the person in the brand-new systems administrator job quit suddenly. Lewis took over and has been responsible for the office's computer software, hardware and network requirements ever since. Recently, she oversaw OHA's conversion from NetWare to Windows NT Server.

By the light of day

While Lewis turns to the dark Fargo streets for LARPing, others of you yearn for clear-blue skies and sun-drenched

days to pursue your passions. Hiking, golfing and biking were among the more popular activities mentioned by the 450 of you who told us about your hobbies in our first You survey. Gardening also received a fair number of hits, as did a variety of water and winter sports.

In all, 38% of you listed an outdoors activity among your favorite hobbies. Take Sandy Joren, a network architect with Lucent in Warren, N.J. He spends much of his free time casting a fishing line and hoping he'll reel it back with a big old bass hooked.

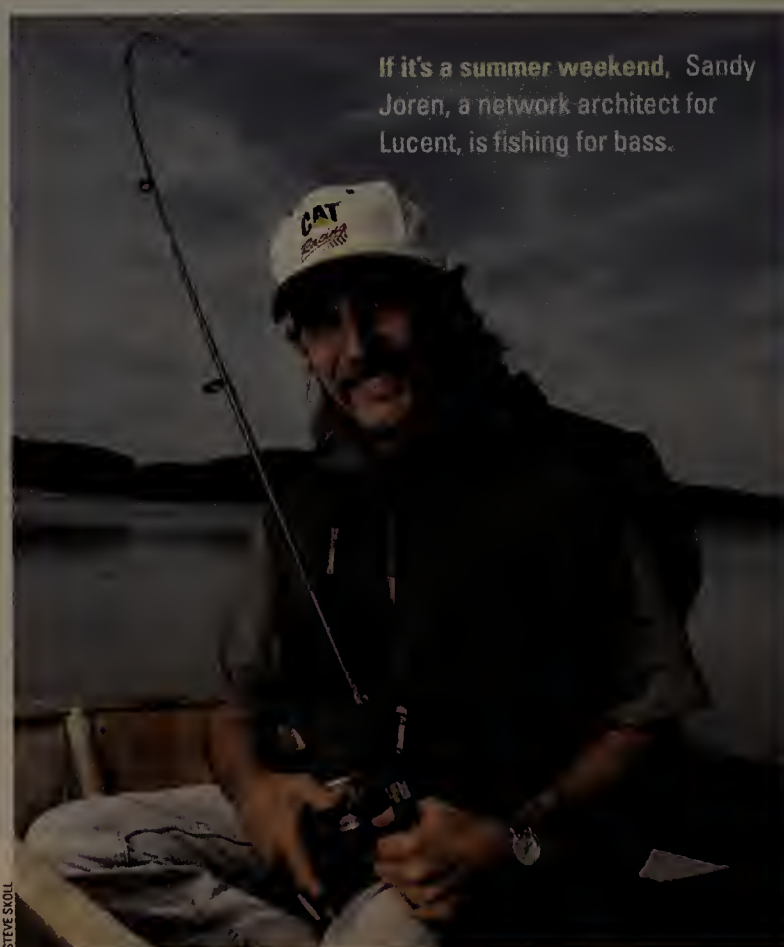
Joren is a *Network World* reader who is quite serious about his hobby. He and a buddy fish the American Bass Association's (ABA) yearly team tournament, which takes them to rivers including the Hudson in upstate New York, the Potomac in Maryland and the Delaware in Pennsylvania.

Joren has come a long way from fishing farm ponds during his boyhood in Georgia, but the 47-year-old says has not yet reached his ultimate goal.

"I want my own fishing show on Saturdays," he says, laughing.

While Joren knows he'll probably never win his fortune fishing, he does hope to capture a spot in the ABA National Team Tournament, the year-end classic that nets the top team a fully rigged bass boat. Winning a chance to compete in the event is a matter of being one of the top 10 teams competing in 10 or so larger ABA tournies, each of which typically draws between 60 and 90 boats.

Joren's hobby takes him away from home each weekend from the end of April through late fall. The competitions take place on Sundays, but Joren and his partner hit the rivers on Saturday to get a feel for where the fish are at high tide and when the sun's at its peak, for example. While it remains to be seen whether his devotion will earn Joren a chance at the national tournament, it's not likely



If it's a summer weekend, Sandy Joren, a network architect for Lucent, is fishing for bass.

STEVE SKOL

IN OUR YOU SURVEY we asked what your friends and colleagues would say about you while gossiping. Here's how some of you responded:



"BOY, IS THAT GUY a good golfer — wonder why he does this networking stuff?"

Geoffrey Charest, senior technical architect, EDS



"ARE COMPUTERS AND DOGS all she thinks about?"

Theresa Ann Rossi, academic learning center operator/distance learning technician, Central Texas College



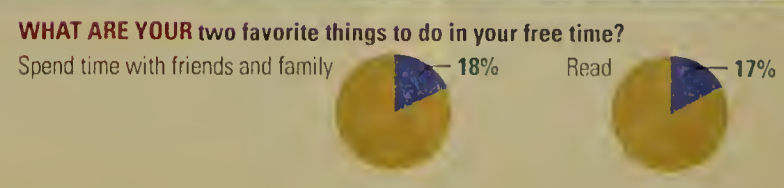
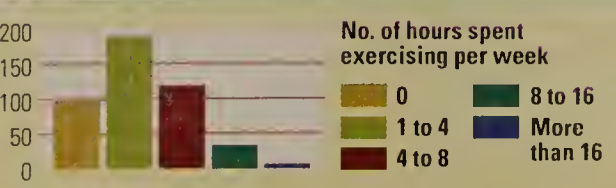
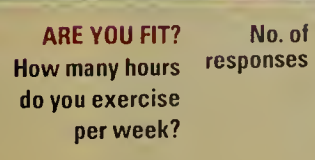
"THAT POOR GUY doesn't know what to do with himself ever since Jerry Garcia died."

Dave Savak, senior network engineer, CheckFree Corp

Live-action role playing turns Trish Lewis, a systems administrator for Social Security's Office of Hearings and Appeals, into a vampire at nightfall.



DAN KOECK



he'll give up the dream. He shows consistent commitment to other pursuits, including music and networking.

Joren has been in the network business since 1984 when he joined AT&T, from which Lucent was spun off. For the past two years, he has been part of a team responsible for planning network resources. The team uses modeling tools to assess how the deployment of

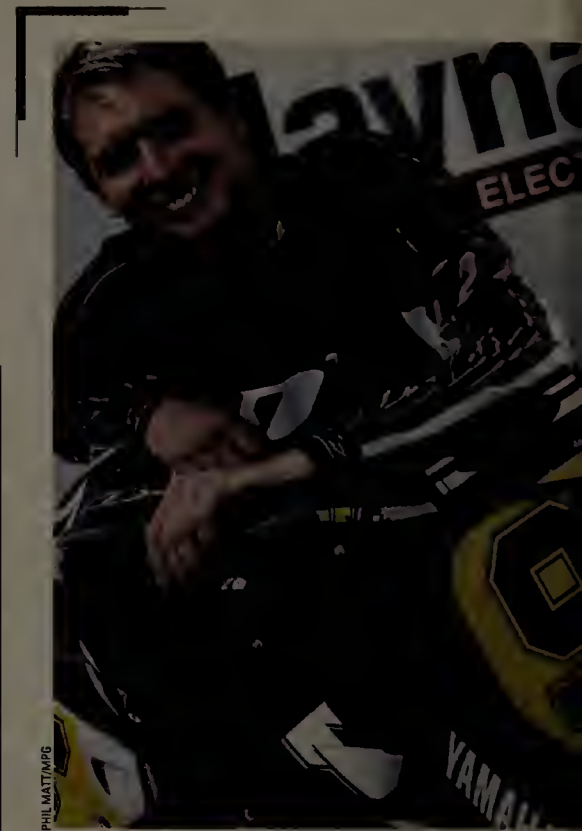
an application will affect Lucent's enterprise network or why an existing application is performing poorly across the network.

Joren came to networking after 10 years of playing in a professional band. Now, for fun, he's into a six-year stint playing electric bass for a blues band and a four-year engagement playing upright bass in a bluegrass band; he sings in both.

Racier challenges

Joren is not the only *Network World* reader who has seen his childhood sport turn into a serious adult pursuit. For Mark Klein, a systems administrator with X/Net Associates in Fairport, N.Y., the sport of choice is motocross racing.

At age 3, while fishing with his father, the 28-year-old Klein cast his line and snagged a minibike that someone had



"I pretty much work to race," says Mark Klein, systems administrator for X/Net Associates and avid motocrosser.

tossed in the river: "My father got it out, fixed it up and, ever since then, I've been in love."

That love turned competitive when Klein reached the age of 12. He climbed on top of a new Yamaha YZ80 and hit his first racing course. Klein loved the action and raced away at this grueling sport for the next six or so years. Motocross is not for the faint-hearted; racers speed on difficult courses carved out of the natural terrain. Add a few man-made obstacles to test a rider's skill, and you've got a strenuous race.

Klein decided against racing while in college, but a few years after graduation he heeded the track's call again. He got his groove back quickly.

Last year, he won the chance to race against 41 other riders for a week last August at the American Motorcyclists Association's National Motocross Championships — "the mecca of motocross racing for amateurs," Klein says. He finished the week 26th in the 250cc amateur class races for riders 25 and older. That's not bad, considering that 2,200 qualified riders started the season.

Klein's overall racing goal is to turn expert and start making money rather than simply pouring the green stuff into his sport. Klein estimates he spent \$15,000 on racing last season.

Klein says his work supporting and maintaining a major auto finance company's paperless network will help him meet that goal: "From the X/Net philosophy of being meticulous, I've learned how to put together a plan of attack and how to stay with it."

Likewise, Klein applies his "nothing's impossible" racing attitude toward his job.

"Someone may come up with a far-out suggestion, and some people will turn their heads and say, 'You're crazy.' But not me," he says. ☆

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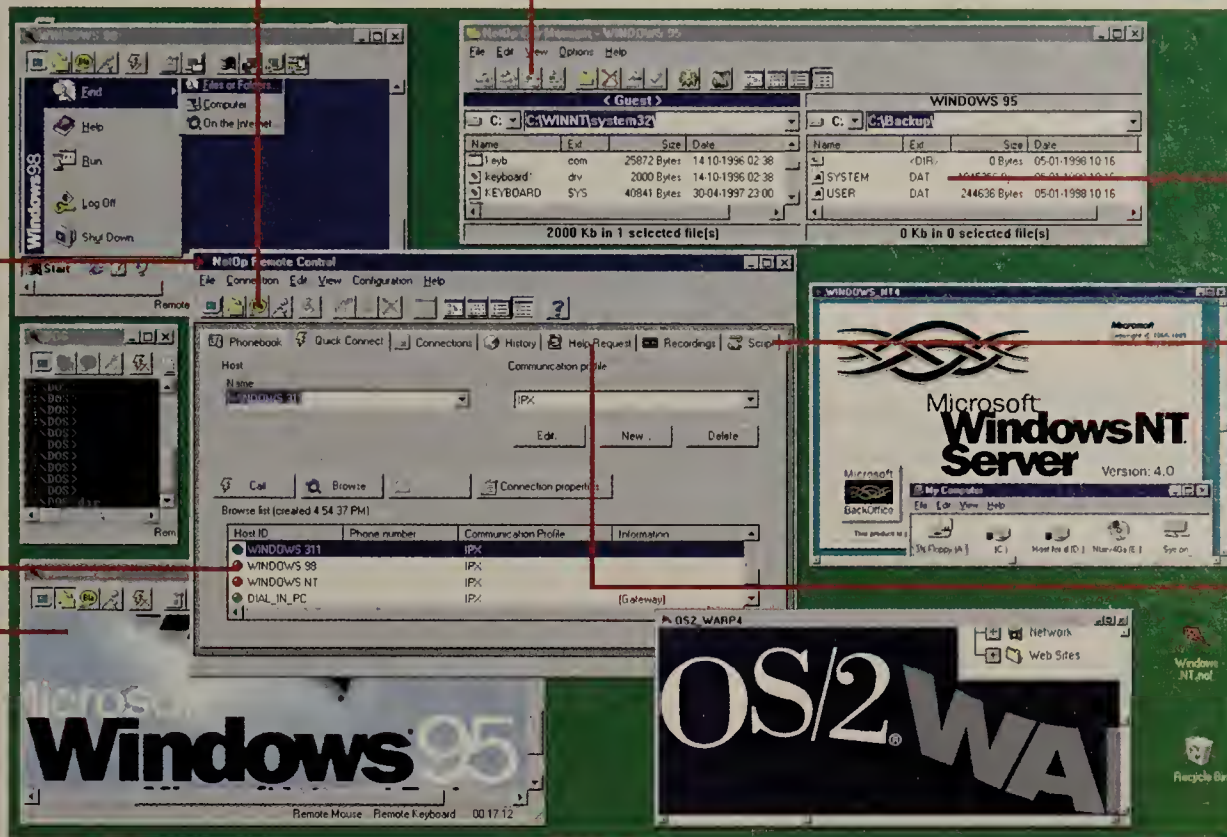
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The point of contactSM

What's on your mind

Six network executives talk about the top issues of the day, from management techniques to technology choices.

BY PAUL DESMOND

I

n the rush to get things done day to day, it's probably not often that you have the time to stop and think about your job itself. How is it changing? What are the key things you need to focus on? How can you best prepare your-

self and your company for the years ahead?

We asked six network executives to take a timeout and talk shop in a round-table discussion that touched on topics ranging from the effect of expanded press coverage on their jobs to how they're dealing with the latest technology issues.

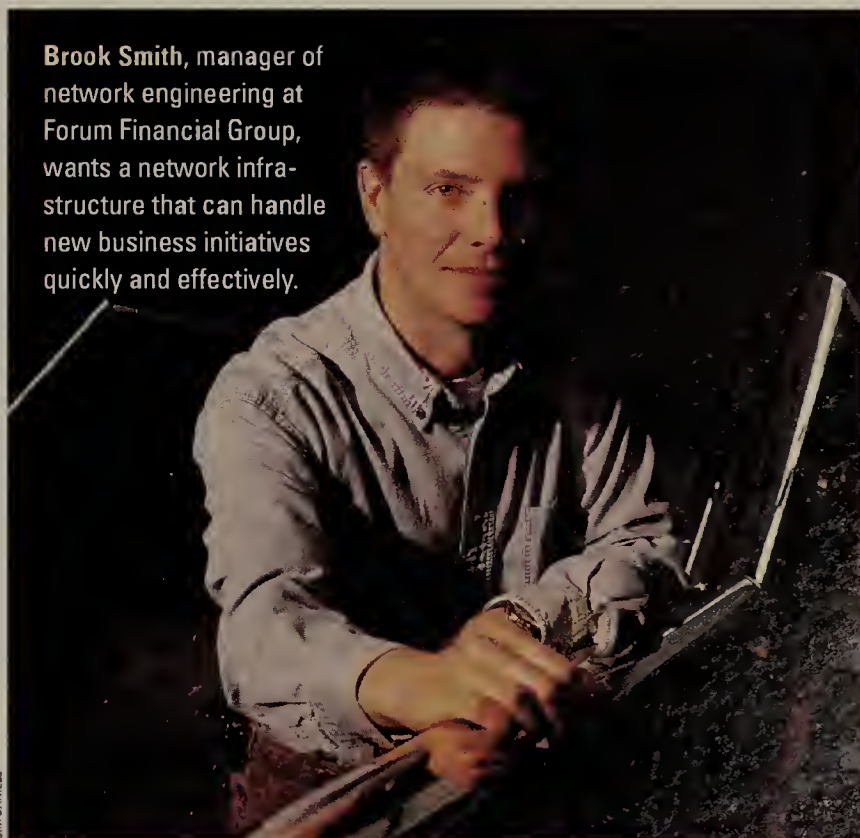
If this group is any indication, you'd best leave that TCP/IP primer on the shelf and instead grab a good management manual or business book. Listening to these users, it's clear that times have changed. No longer is it just a plus for a network professional to be business-savvy. Now it's a requirement, along with strong project management skills. That's not to say you don't need to understand technology. With issues such as IP convergence topping to-do lists, that's far from the case. The point is, your role is now team leader, not chief technology guru. (See "Your Life in 5," page 53).

Joining the discussion were Russ Davis, assistant director for network services at Ernst & Young in New York; Mike Hinkle-Morrison, former chief information officer (CIO) at Pier 1 Imports and chief technology officer at TGI Friday's restaurant chain, who is currently searching for his next challenge; Gene Rindels, CIO of Respiroics, Inc., a global medical device manufacturer in Pittsburgh; Brook Smith, manager of network engineering at Forum Financial Group, a mutual fund company in Portland, Maine; George Sullivan, senior network architect at Northrup Grumman, an aerospace manufacturer in Bethpage, N.Y.; and George Yeager, manager of architecture and design at Columbia Energy Group Service in Columbus, Ohio.

The round-table discussion was moderated by Paul Desmond, who until recently was *Network World's* features editor. He is now vice president of King Content, a custom publishing company focusing on information technology.

For some time now, business publications and even the general press have been covering network-related issues. What effect has this increased exposure had on your job?

Brook Smith, manager of network engineering at Forum Financial Group, wants a network infrastructure that can handle new business initiatives quickly and effectively.



JIM DANIELS

STRESS RELIEF How do our round-table participants deal with work-day stress?



"I've been trying to convince everybody that Key Largo is the next best location for our network operations."

Gene Rindels, chief information officer, Respiroics



"What I've done is just try to make sure I'm not the person who is always in the position of being the tactical expert. I try to rely on the staff as much as I can to configure and test, and keep my head out of the dust cloud so I can see where we're going."

George Yeager, manager of architecture and design, Columbia Energy Group Service

Sullivan: The coverage is helping to pull us out of the shadows of strategic planning and into the daylight. For me, it's easier to find an audience for proposals and to secure funding for a well-considered project.

Rindels: The heightened awareness has had a positive impact. We are now becoming more and more a business partner and technology mentor within the senior business leadership team.

Davis: Our senior management awareness has been heightened dramatically regarding networking's complexity. That's generally a good thing.

Are there any negative consequences from all this press coverage and upper management's heightened awareness?

Yeager: The impact is largely positive. The only slight negative might be that folks read about technology and think it's awfully easy. It still takes a lot of planning to implement.

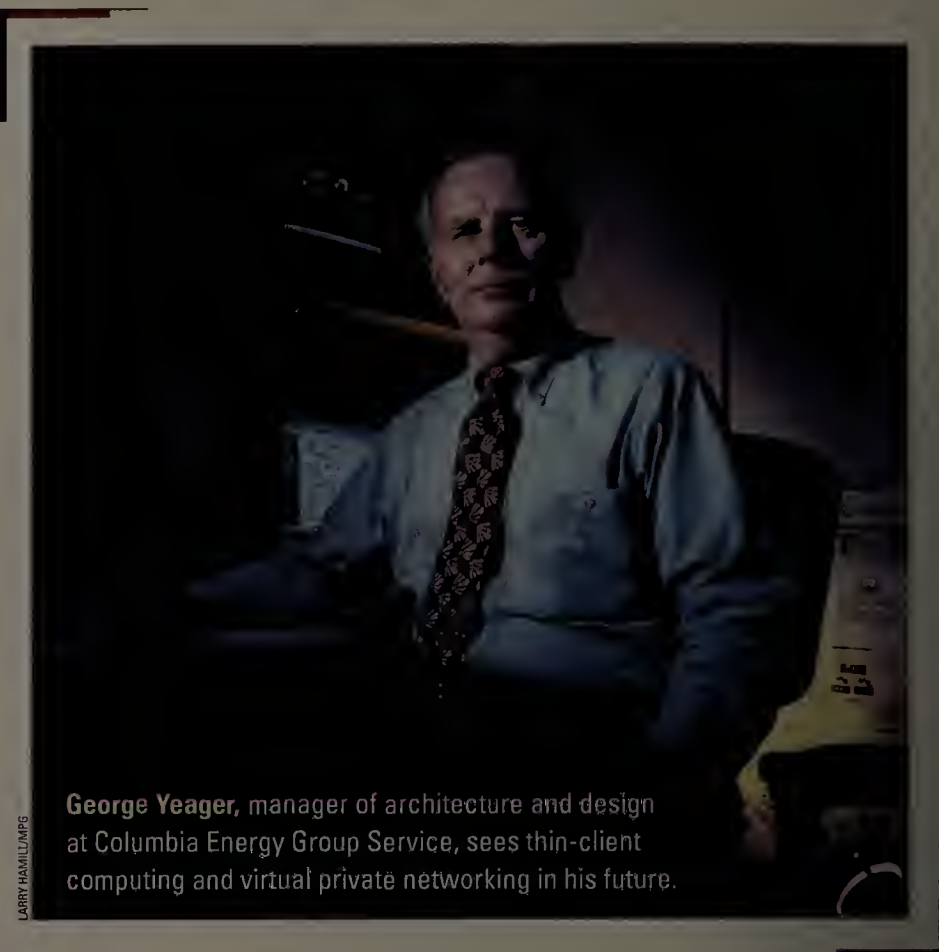
Sullivan: What about the lag between the introduction of a new technology, the latest 'gec whiz' thing, and the time that you can institutionalize it and roll it out? We have to be sure to do a good job of communicating with management and letting them know what risks are associated with new technologies, and that we are trying to integrate these things where it makes sense and where it doesn't endanger enterprise assets.

Electronic commerce is one of the areas the business press has been focusing on. In what ways has the whole e-commerce movement had a positive effect on your company and on the network group in particular?

Yeager: Everybody views this as a positive trend. With respect to the network group, it's raised our corporate visibility. It's increased pressure on us to get things done quickly, so we're seeing a lot happening much more rapidly in our nonregulated business.

Sullivan: The Department of Defense is pushing the concept of integrated products, which are teams across various specialties and across different companies. We find ourselves in a mode of operation that has been dubbed 'co-opetition.' The biggest companies in our industry are Boeing and Lockheed Martin. We are partners with them on a lot of projects, but we're competing with them on other projects. So we have a number of specialized network links to do e-commerce with them on specific products.

Hinkle-Morrison: In some cases, you don't know what kind of volume can hit you. And that is what challenges you, from the network side. And in the future, it's going to challenge the network group even more because we'll be doing real-time ads. [Real-time advertisements are tailored to individual customers based on known preferences or artificial-intelligence mechanisms that assess likely preferences. They also enable retailers to quickly change product



George Yeager, manager of architecture and design at Columbia Energy Group Service, sees thin-client computing and virtual private networking in his future.

offers to increase the likelihood of a sale.] When you get into real-time ads, your network group needs to be tied in with your marketing team to know how much to open that pipe because you don't want to leave it open all the time and just pay a lot of money for something that's not used. In fact, this is the first time I've seen the network people sit in a room with the marketing team doing projects.

E-commerce gets a lot of attention, but if you could only focus on one network initiative for the next year and Y2K is off the table, which one would it be?

Davis: I would say focus on a multiservice network infrastructure that supports integrated voice and data. There's a large opportunity there for cost savings within Ernst & Young.

Smith: I completely agree with that. Building the infrastructure to support initiatives that come in a quick and efficient manner is key. That's one of the things we're focusing on at Forum Financial.

Rindels: I'd have to come back to the e-commerce initiative as probably the single area we'd like to have the freedom to focus on.

Hinkle-Morrison: You have to try to make sure that the end points are able to accept any kind of transport technology that you can see, at least for the next three to five years — whether it's cable, digital subscriber line or satellite — as well as deal with prioritizing traffic.

Yeager: I agree with that. But something we're also concerned about is the appearance of a large number of new small offices in our business. We'll probably go with thin-client computing and virtual private networking, which is also related to end-point flexibility. This is an area where I think we can make a big dent in the cost factors associated with our small offices.

Sullivan: It's difficult to figure out which is the most important. I'm thinking of a three-legged stool. Which of the three legs is the most important one?

One of the three most important initiatives we have is virtual private networking of various types, especially in the extranet arena and in remote access. Another initiative that we've started working on this year is Lightweight Directory Access Protocol, or directory services. How are we going to employ directory services, and how is that going to help us manage and control our mix of applications, people and systems? And the third initiative we're working on is multipurpose, multimedia networking over an IP network. We've been doing various tests and trials of voice and video over IP and over our Switched Multimegabit Data Service plant.

Yeager: That would be our second initiative for the year coming: voice and data convergence. We're doing pilots right now on that. And I see tremendous opportunities for us.

See **On your mind**, page 68



Gene Rindels, CIO of Respirationics, would love to have the time to focus more attention on e-commerce.

NETWORK AGENDA What are some of the technologies round-table participants are deploying and testing today?



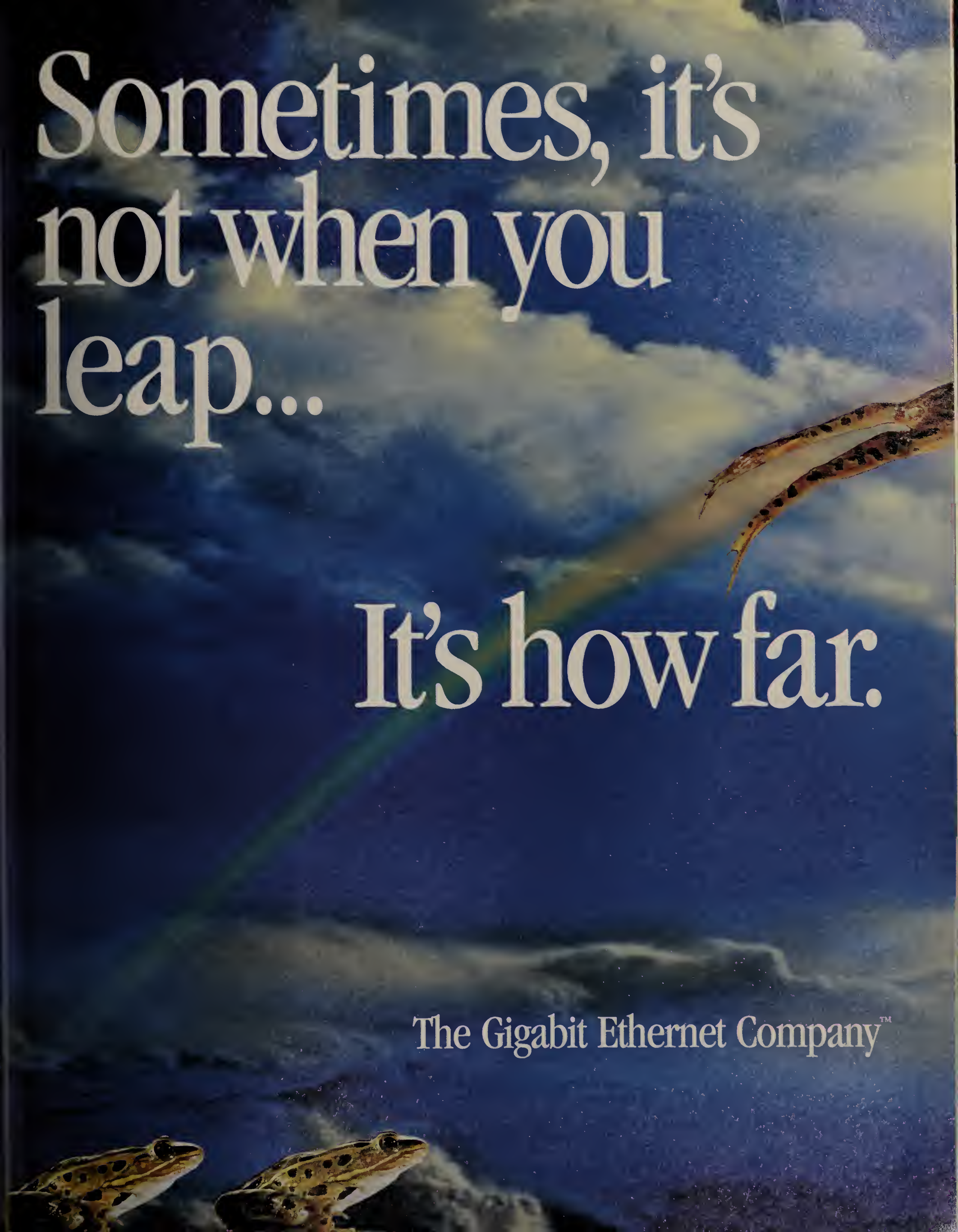
"We have a project underway called Infrastructure 2000, which is a refreshing of most of our infrastructure. . . . We've had a goal since 1995 to have an all-IP network."

George Sullivan, senior network architecture, Northrup Grumman



"We're already an all-IP network because we're a fairly new company and we started out that way. But we're trying to add layers of redundancy and availability to our network."

Brook Smith, manager of network engineering, Forum Financial Group



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not when you
leap...

It's how far.

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On your mind, continued from page 66

It sounds like most of you think convergence — the idea of voice, data and video all riding on an IP backbone — will play a big role in the enterprise. How soon do you think we're going to get there?

Davis: It's probably one to two years down the road for all but the most aggressive of companies that are willing to take some risk now.

Yeager: We have two voice-over-IP pilots underway, one with Lucent and one with Cisco. We see this as a strategic method of simplifying our network architecture. We see it as a way to open the door to [computer-telephony integration], something that seems to have eluded most of us. And we see it as the direction in which the global telephony infrastructure is moving. So we want to cautiously approach it, which is why we're doing the pilots. We'll evaluate afterwards, and we may attempt to roll out some small pieces in 2000.

Hinkle-Morrison: From the retail side, I'm seeing 2001 and 2002 being the timetable. We have to get price down dramatically because profit margins in the retail industry aren't high enough to have much cost overhead added to the business.

What would you say are the most important steps you can take today to prepare your network for the years ahead?

Davis: Don't focus on simple network connectivity, or even LAN connectivity, but on application connectivity across the enterprise with performance and service-level objectives that are well-defined. If you're not there by now, you'd better get there quickly because a dramatic change in the network industry is occurring.

Yeager: We're installing an ATM backbone with frame relay internetworking. And we know that voice over IP is coming, so we're buying routers that support voice. We know that thin-client technology and virtual private networks are ways to incorporate large numbers of small offices into a network efficiently and rapidly. Those are the steps we're taking.

Hinkle-Morrison: The big word I have been using is 'simplify.' We inherited complicated networks. The good thing about Y2K is that it gave us an excuse to get rid of the old stuff and to try to consolidate to one protocol.

Rindels: A key thing we're trying to do is to build in interoperability and then also to ensure that high availability is a key attribute of our architecture. We're doing this so we can continue to meet our service levels and be positioned to take advantage of some of the new emerging technologies.

What skills would you say will be most important for network managers to have as we look ahead two or three years?

Yeager: We're clearly moving away from the nuts and bolts. We need leader-

Russ Davis, assistant director for network services at Ernst & Young, sees potential cost savings in a multi-service network that supports integrated voice and data.



STEVE SKOLL

ship skills and project management skills. We need to be able to create, maintain and present for our customers a clear and steady vision. We've got to make things happen quickly and creatively, and we've got to have good measurements to demonstrate quality of service for our customers. If we can't do these things, we're not going to make it.

Rindels: It's all about where we can add value to the business, and the business is asking us to add value in new areas. The senior folks now who are moving into the network management area typically have more intimate business knowledge and can have a more profound impact on the business. And this is where our leaders would like us to focus resources.

Sullivan: There are two general skill sets that are more people-oriented as opposed to technology-oriented, and they have to do with relationship management. The network is basically the relationship between a whole bunch of systems, and the systems are basically run by people. Probably the most important job for a network manager to understand is one of being a relationship manager between the different people and the different business units.

The other important skill, and it's always been important in our area, has been project management. How do you get something done in your business environment? And it could be managing an outsourcer. The point is, you still have to know all the buttons to push and the wheels to spin to get the project off the ground, funded and justified.

Any tips for developing those skills?

Hinkle-Morrison: It really has to be part of how you run your business. Make sure you have a methodology that's used not just in network management, but throughout the company. That way it's bred into the culture.

Most people would agree that there's a shortage of good, qualified technical people. What are your secrets for dealing with this issue? How do you keep your best people and make sure you hire good people?

Davis: In terms of hiring, we try to look for individuals who can grow, in addition to seasoned network professionals, and who fit within our culture. In the area of staff retention, I think it's important that everyone in the group understand the vision and the strategic direction we are moving toward. The network is really a very important part of the firm, and it's instrumental to Ernst & Young's continued growth. Our people understand that. And they understand that their job is important and is really shaping the firm's future, which is a big factor in staff retention.

Yeager: We try to reduce our vulnerability by essentially outsourcing; manage the vendor instead of the technology. For example, we've outsourced our Internet firewall management process. We try to use ATM and

See *On your mind*, page 70

George Sullivan, senior network architect at Northrup Grumman, picks virtual private networking, directory services and multimedia networking over IP as the biggest technology issues he faces.



STEVE SKOLL

WORDS OF WISDOM
Round-table participants share some advice:



Russ Davis, assistant director of network services, Ernst & Young

"For network managers and even network engineers, there's a need to move away from some of the technical and physical aspects of networking. These are really not strategic."



Imports and chief technology officer at TGI Friday's

"Make sure you have the infrastructure in place so you can control how you move information and the priority of it."

Mike Hinkle-Morrison, formerly chief information officer at Pier 1

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On your mind, continued from page 68
frame relay as much as we can, so many of those management issues just move into the carrier domain. We try to hire folks who we think can do the job and will fit into our culture. We do a lot of training. And we try to let our people work in self-directed work teams as autonomously as we can.

As far as salary goes, we're probably

not at the top, but we pay a reasonable salary. And we try to advance our people as quickly as we can where they demonstrate skill and dedication.

Rindels: It's restating the obvious to say that our people are the most valuable resource we have, but we behave in a way that recognizes that. We also understand that, unfortunately, we probably all spend more of our daily

lives in the office with our associates and colleagues than we're able to with our families. You need to recognize that and to place the same value on that [work] time that I'm sure we all do when we have time with our families. It clearly has to be more than a job or you're never going to succeed at attracting and retaining some of the best people in the industry.

Brook, any thoughts on staffing from the smaller company perspective?

Smith: It sort of mirrors what everybody else has already said. You have to enable the people that are doing a lot of the work to have ownership for what they're doing. They have to know what the task is and be allowed the leeway to get it done in a way they think is right, as long as it meets the models that you've set up for them, and to work with the business managers along the way so they understand the vision and the purpose [behind projects].

Here's where you get to give some advice to your vendors. If you could give the CEO of one network vendor one bit of advice that he would be forced to take, which

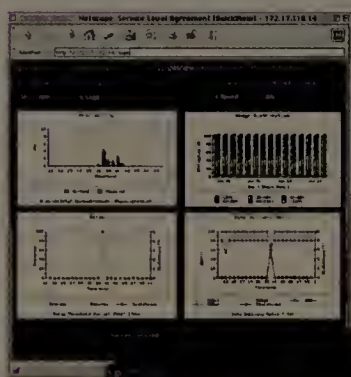


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Mike Hinkle-Morrison, who recently left his CIO position at Pier 1 Imports, doesn't see convergence coming to retail networks until at least 2001.

CEO would you choose and what advice would you give?

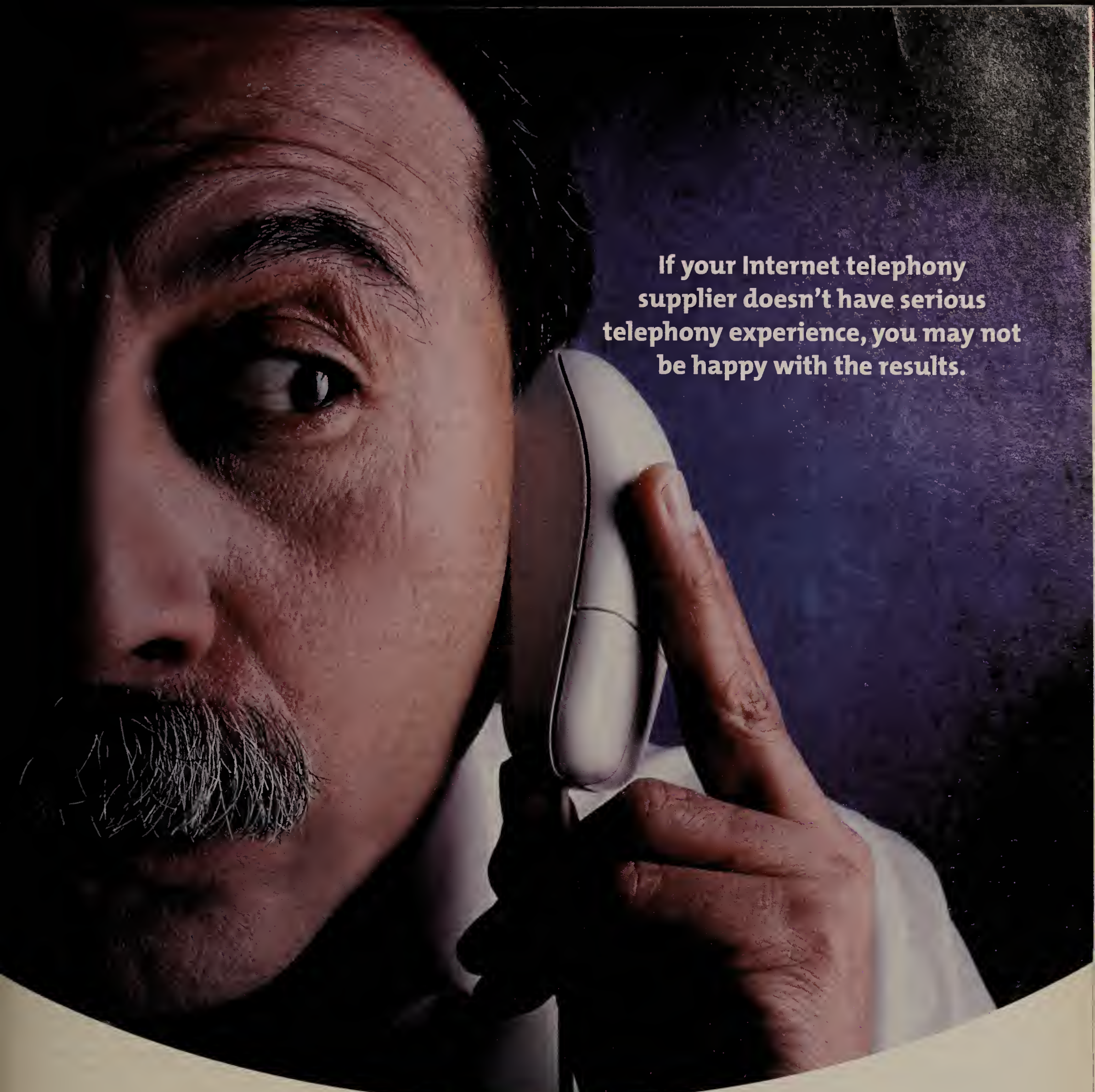
Davis: I would choose John Chambers, CEO of Cisco. The advice would be to foster simplicity in terms of intelligent networking. The problem we all face is the onus is on us to do much of the system integration for products from Cisco and other leading network providers. If you take a look at the staffing, the support costs, the technical skill set required to keep large enterprise networks running at peak performance, these costs are absolutely huge and they're growing rapidly.

Rindels: I'd have to say Piyush Patel of Cabletron. Although innovation and advances in technology are oftentimes the path to reaching the top of your particular industry, service and quality are the things that help you stay there. I would say that Cabletron needs to remain cognizant of that.

Sullivan: I would like to see more cooperation from the carrier side of the house. All too often, some circuits fail somewhere. Failures are a fact of life, but I would like to see more cooperation, especially among WAN people and

See **On your mind**, page 72

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On your mind, continued from page 70
the local exchange carriers.

Yeager: I pick all the interexchange carrier CEOs, and there are four or five things I would tell them. One: Listen to your customers. Two: Don't promise what you can't deliver. Three: Deliver what you say you can when you say you will. Four: Solve problems quickly and creatively. Thirty to 45 days does

not work in today's business environment. And when you've done that, render me a bill that I can read and use to bill my internal customers.

Smith: From a smaller company's perspective, our problem is just access to information. We're a nobody to Microsoft, Cisco, Novell or any of the other big companies. Seldom do we get timely information on fixes for prod-

ucts directly from them. We end up going to outside sources, trying to find it through newsgroups and so on. But that research is time-consuming.

Any particular vendor you want to pick on in that regard?

Smith: Cisco. We're implementing a new Cisco network, and until we purchased some product, we weren't able

to get into its Web site and get any of the good nuggets to help us do some design. To get a lot of the white papers and such, you have to be a customer, which I found rather frustrating.

What work-related issue do you find most worrisome?

Davis: The vast amount of technical attention to detail that's required to keep large-scale networks operating. A single defect in design or configuration is going to have a devastating impact on the network operation and translate directly back to the business.

Smith: Knowing there are single points of failure out there, and knowing that try as you might, you might not have identified them all. Those are the ones that keep me up at night wondering, 'OK, where is that beast that's out there looking for me?'

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Rindels: I would say something I refer to as IT synchronization with business velocity. Timing is everything. And this really refers to the well-timed execution of aligned business and network strategies. The evolution of technology is what makes this one of the more challenging attributes of the job.

Our systems are becoming so complex today with the advances in technologies, it's somewhat analogous to the folks at NASA launching a space shuttle and people starting to act like that's a routine event when it's a phenomenal technology achievement.

Any closing thoughts you want to share?

Rindels: It gets lonely in the darkness of night, and you begin to wonder if you're unique. It's refreshing to hear that some of the professionals in this area share the same worries, concerns and challenges that I have.

Yeager: I agree. I'm glad to hear I'm not that far off base and that everybody else is having the same sorts of problems.

But one of the things that didn't come up, that I kind of think is interesting, and is probably somewhat related to stress, is the role of professional organizations. I happen to be a member of CMA, the Communications Managers Association. And I'm also a member of the IEEE. I have found both organizations have been wonderful. Having local meetings, regional conferences and conventions, and just meeting with your peers once a month is just an absolutely wonderful way of making sure you're not the voice in the wilderness.

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Volunteerism is alive and well in the network profession.

BY DOUG BARNEY

N

ext time you're watching a wrenching video clip of search dogs sniffing through twisted steel and crumbled cement, perhaps you can take heart that one of your own has helped get the rescue animals to the scene.

Sandra Kay Miller, remote access specialist for Elixir Technologies, is the resident computer guru for the National Disaster Search Dog Foundation.

In her volunteer capacity, she has been called upon to set up the office, create a Web site and publish manuals for the foundation, founded four years by an acquaintance of Miller's in the wake of the horrific bombing of the federal building in Oklahoma City.

And Miller gives more to the foundation than her technical mind. The 34-year-old spends four to seven hours per week writing articles for the Ojai, Calif., group.

What's more, she is raising a Labrador that will be trained for rescue work — a task that is not as easy as it sounds. "Disaster search dogs are encouraged to bark and dig — need I say more?" Miller says.

While critical, the computer work Miller has done for the foundation has been child's play compared with some of the tasks she's undertaken in various jobs. For example, she's built networks for offshore oil rigs and set up a virtual private network for a major outdoor clothing manufacturer.

Miller says the knowledge she's picked up on such jobs has been an asset for the foundation,

but she emphasizes that the volunteer work has enhanced her technology skills, too. Had she not needed to establish the foundation's online presence, for example, Miller would not have picked up the Web development skills invaluable in today's workplace.

Miller is far from the only *Network World* reader who devotes time to volunteering. In fact, almost 20% of the 448 of you who responded to the volunteer question on our first You survey say you give between one and four hours of your time per week.

Miller is far from the only *Network World* reader who devotes time to volunteering. In fact, almost 20% of the 448 of you who responded to the volunteer question on our first You survey say you give between one and four hours of your time per week.

Jack of all trades

Julio Edwards, an assistant to the IS manager at the Department of Regulatory Agencies (DORA) in Denver, falls into that group. He's involved in six charitable organizations, in most cases lending Internet or video skills.

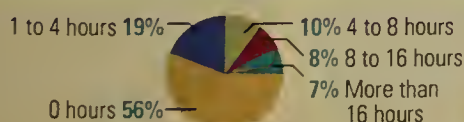
If there is a theme to Edwards' volunteer efforts, it seems to be bringing meaning to people's lives. His latest project is building a Web site for Anam Chara (Gaelic for "soul friend") Homes, an organization that builds Victorian-style group homes for senior citizens in Colorado. "Residents pass away in their home surrounded by loved ones



BRUCE HERSHEY

Sandra Kay Miller, remote access specialist for Elixir Technologies, shares her skills with the National Disaster Search Dog Foundation.

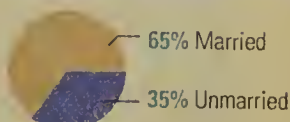
HOW MANY HOURS per week do you volunteer?
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- Teaching kids to read
- Working with Habitat for Humanity

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rather than in an austere hospital setting," he says.

The 46-year-old Edwards has long been a volunteer, but his giving has changed over the years. "In the past, I volunteered mostly my unskilled labor, whereas now I try to focus on what I can technically bring," he says.

Like Miller, Edwards believes his volunteer work has helped on the paid

side. For example, Edwards learned Web development to build a site for his community television series, "Spiritual Spectrum," and has built a Web site for a spiritual group called The Beauty, Truth & Goodness Foundation. Now Edwards designs, maintains, enhances and supports DORA's Internet and intranet sites, as well as researches new technologies for the agency's use.

In the end, Edwards gets just as much as he gives: "Computer nerds like me can get caught up in the technology and tend to be loners. Volunteer work brings out the extrovert in me. It is such a good feeling to be helping people."

I'd like to teach the world to browse

For another of you, volunteer work brought out more than just a personali-

PATRICIA BARRY-LEVY



Julio Edwards, an assistant to the IS manager at the Department of Regulatory Agencies, lends his skills to six charitable groups.

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When a major manufacturer needed to deploy a newly developed Lotus Domino-based supply chain solution to improve communication with channel partners throughout Europe, the Middle East and Africa, the obstacles appeared formidable. Channel partners needed immediate access to inventory data in central databases; however, the technology and resource allocations imperative to building and maintaining the necessary infrastructure and firewalls were virtually nonexistent. And even if the company could have assembled the necessary deployment expertise, it could not afford the investment and potential lost opportunities a successful, timely implementation would require.

That's why the company made a strategic decision to outsource to Interliant, the world's leading provider of hosting solutions. Interliant provided speedy deployment on a dedicated Lotus Domino server, plus the resources and expertise to make it happen in days. The company achieved the instant access and 24 x 7 support its partners needed, as well as the geographic coverage and security it required.

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Free Product info enter NWInfoXpress #58 online @ www.networkworld.com/infoxpress

ty trait — it actually turned you on to networking.

Linda McGinnis, a manager at World Bank, got into networking in 1997 when she helped found a nonprofit organization that connects schools in less developed countries to the Internet and each other.

By 2000, the World Links for Development (WorLD) organization hopes to bring networking to more than 1,200 secondary schools in 40 countries and, in the process, provide distance learning and expose students to other cultures. The group is working in 14 countries.

While McGinnis, co-manager of WorLD, didn't come from a technology background, she does have some strong opinions on the subject. "Information technology is a double-edged sword that can either drive rich and poor countries further apart or be the great equalizer that can enable developing countries to leapfrog into a more-level playing field of education and opportunity," she says.

Passion such as this is what turns net professionals into people who make a difference. ☆

DO YOU WANT TO MAKE A DIFFERENCE?

Network World will soon partner with the United Way to match readers up with non-profit groups in need of IT expertise. Go online for information about how you can lend your skills to a good cause.

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Who's Who IN THE Networked World



Scott Stouffer
President and CEO
Visual Networks
(301) 296-2300

www.visualnetworks.com

Visual Networks®, Inc. (NASDAQ: VNWK) is the originator and leading provider of WAN service level management systems for public network services like frame relay, ATM, and IP. The company's flagship product, Visual UpTime®, has changed the deployment model for public network services by enabling end-to-end instrumentation of the network for performance measurement and analysis, allowing network service providers to achieve required service levels and to lower operating costs. Utilizing the Visual UpTime system, service providers are enhancing customer loyalty, drastically reducing operational expenses, and lowering their customer's total cost of ownership. Visual Networks' headquarters are in Rockville, Maryland.



Sean Keohane
Sr. Vice President, Sales & Marketing
Allied Telesyn International
(408) 730-0950

www.alliedtelesyn.com

Allied Telesyn continues to set standards for price/performance networking with its extensive Ethernet, Fast Ethernet and Gigabit Ethernet solutions. Our portfolio is one of the industry's most extensive, ranging from simple connectivity devices such as transceivers and media converters, through sophisticated Layer 3 switches with Gigabit uplinks. The convergence of voice and data networking will see growing demand for IP-orientated technologies. Allied Telesyn intends to make it all highly affordable.



David J. Richards
President
CrossTech Corporation
(800) 675-0729

www.remotecontrolsw.com

CrossTec Corporation is the exclusive distributor in North America of the award winning NetOp line of remote software products. NetOp Remote Control provides fast and easy support of distant Windows, DOS and OS/2 PC's over modems, networks or the Internet while NetOp School provides teachers with interactive instruction software for networked classrooms.



Ivan O'Sullivan
President, Internet Products Division
Elron Software, Inc.
(800) 767-6683

www.elronsoftware.com

With an installed base of six million licensed users at over 13,000 organizations, Elron Software and its award-winning Command View product family provides integrated solutions for helping organizations to manage the risks and to maximize the productive use of the Internet. The CommandView family includes: Internet Manager, Message Inspector, Bandwidth Optimizer, and Firewall.



Thomas Murawski
President and CEO
NetMoves
(732) 906-2000

www.netmoves.com

NetMoves' goal is to accelerate the transition from the traditional costly and labor intensive methods companies currently use to move documents — like U.S. Mail, overnight delivery and courier — by enabling them to deliver their business-critical documents over the Internet, using various software programs, web sites, and hardware devices and existing e-mail infrastructure.

... the cable holdings will boost AT&T's annual revenue growth from about 6% to about 11%

SPECIAL ADVERTISING SECTION

strategy moves away from circuit-voice and data over cable networks — technology that is

could really talk with one another while sitting together in your data center.

Would NetWare and Unix herate Windows 2000, the new kid on the rack? Would Kid 2000 fire off insults to the old stalwarts? And would

happen NetWorld Technica, Microsoft, Cruz Of Software from each bers and

Who's Who IN THE Networked World



Gordon L. Stitt
President and CEO
Extreme Networks
(408) 579-2800

www.extremenetworks.com

Extreme Networks™ builds networks that adapt swiftly to change and empower the delivery of ERP, e-commerce and other web-based applications for the new enterprise. Extreme combines Gigabit Ethernet and IP with wire-speed Layer 3 switching and quality of service to deliver more information faster and accommodate future growth. Extreme's Summit™ stackable switches, BlackDiamond™ chassis switches and ExtremeWare™ software share a consistent architecture for end-to-end simplicity across the enterprise. From desktops to the network core, Extreme makes it easier to manage and scale the enterprise, while reducing network ownership costs.



Bobby Johnson
President and CEO
Foundry Networks
(408) 731-3800

www.foundrynetworks.com

Foundry powers forward in price, features, and performance leadership for Gigabit Ethernet backbones. We power-up user networks with: • the BigIron 8000 which is the highest performing LAN switch at 96 Mpps, • the BigIron architecture which is the only architecture that is 10 Gigabit Ethernet ready, and • the BigIron architecture that is Layer 2, Layer 3, Layer 4-7, and Packet over Sonet equipped for 10/100 and Gigabit Ethernet environments.



Bryant Dunetz
CEO
Telco Exchange
(877) 988-6484

www.telcoexchange.com

Telco Exchange is an e-commerce site (www.telcoexchange.com) that provides enterprise customers in the \$50 billion data network services market with a single web-based interface for pricing and ordering high bandwidth digital circuits with carriers across the U.S. and Canada. Our nationwide VAR partner program facilitates local installation of the Internet and WAN applications by certified network engineers.



Gil Shwed
CEO, President and Founder
Check Point Software Technologies, Ltd.
(650) 628-2000

www.checkpoint.com

Check Point Software is the worldwide leader in secure enterprise networking solutions. The company's architecture includes network security, traffic control and IP address management. Check Point solutions enable customers to implement centralized policy-based management with enterprise-wide distributed deployment. Via the OPSEC Alliance, Check Point's solutions seamlessly integrate with products from more than 200 industry partners.

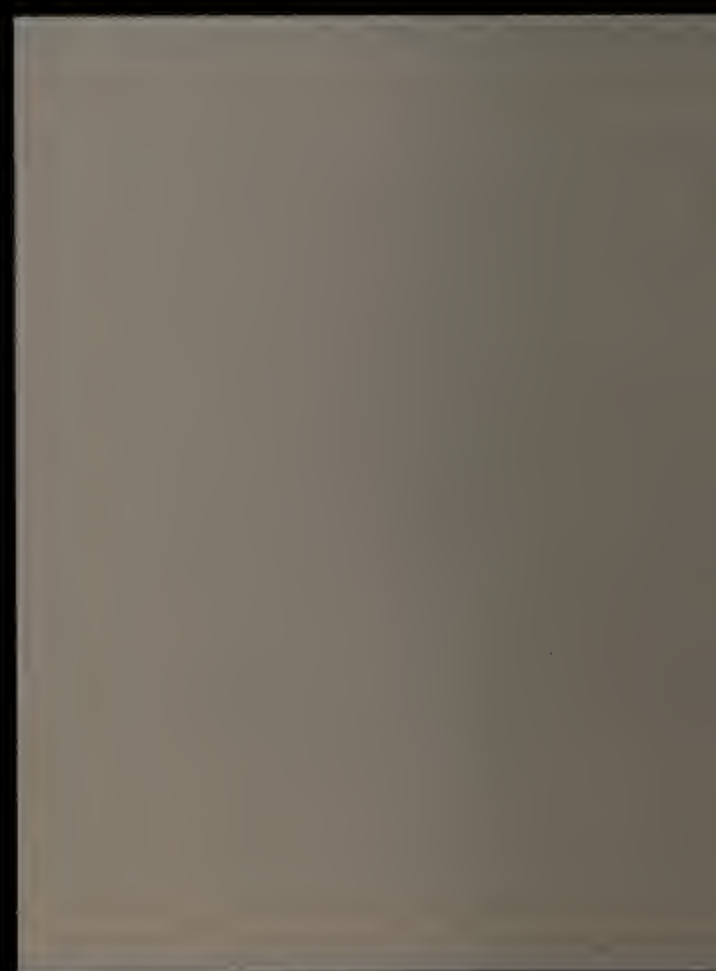


Akio Sakamoto
CEO
HolonTech Corporation
(408) 369-4600

www.holontech.com

As web-based applications become more critical, downtime in the physical infrastructure means lost revenue and lost customers. Whether for e-commerce, an extranet, or an intranet, your e-Business infrastructure must be reliable, responsive and robust. HolonTech Corporation products are switch-based clustering and load-balancing traffic managers that provide high performance, increased security, and simple installation.





SPECIAL ADVERTISING SECTION

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Paul Su

President

AOpen America, Inc.

(800) 85-AOPEN

www.aopen.com

The demand for reliability and compatibility becomes more critical with the increasing sophistication of users and their applications. AOpen provides the answer. As the component manufacturer of a US\$7 billion dollar group, AOpen is the only technology company in the world offering a complete line of high quality, leading-edge components to satisfy every need, from single component upgrades to full PC systems integration and total networking solutions.



William Rosenberger

President and CEO

Network Peripherals, Inc.

(408) 321-7300

www.npix.com

At NPI, The Gigabit Ethernet Company™, our NuWaveArchitecture™ is setting new standards for performance, flexibility and economy in the exploding Gigabit Ethernet switch market. NuWaveArchitecture is a 64 Gbps crosspoint switch fabric, ASIC-based system that delivers wire-speed, non-blocking performance in stackable or standalone switches to OEM and VAR customers at prices 30 to 50 percent lower than competitive products.



Anthony DeKerf

President

Tron International, Inc.

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www.tron.com

As market demand for KVM Switches has increased, the technology itself has grown beyond off-the-shelf products with complex technology in today's Multi-Console KVM Switch Systems. Tron International, Inc. assists IT Professionals, resolving computer lab growth and productivity issues with comprehensive product sales and services. Our goal is to provide a clear understanding of each product's design concept.



Vinita Gupta

Chairperson and CEO

Digital Link Corporation

(888) 280-5465

www.dl.com

Digital Link Corporation, the market leader in inverse multiplexing solutions, introduces a new broadband platform for an emerging class of multimegabit access, the DL5400 MultiLink Access Device. This standards-based, inverse packet multiplexer creates a unique class of intelligent internetworking products that allow carriers and ISPs to offer new services for point-to-multipoint applications above T1/E1 rates.



Noam Lotan

President/CEO

MRV Communications

(818) 773-0900

www.mrv.com

www.nbase-xyplex.com

MRV Communications, Inc. is a world class leader in high-speed optical network components and systems. Its products integrate switching, routing, remote access, and fiber-optic transmission to enhance the performance of LANs (Local Area Networks) and WANs (Wide Area Networks) and telecommunications networks. MRV's fiber optic transmission components send voice, data and video to carriers and residential networks. Through its NBase-Xyplex brand, the company provides network enhancement solutions that accelerate the deployment and improve the performance of complex data networks.

Your favorite 50

Our 1999 Favorites & Greatest Survey shows what you like best —
to do, to hear, to see and to read.

W

hat an eclectic bunch you are. We found that out through our inaugural Favorites & Greatest Survey, which we ran on Network World Fusion from April through June.

Some of your tastes soar to the heavens, while others are — well, who are we to judge, we came up with the questions.

1. Only brand of jeans worth wearing: **Levi's**
2. No. 1 vacation destination: **Hawaii**
3. Favorite painting or other work of art: **Leonardo da Vinci's "Mona Lisa"**
4. Favorite hobby: **Reading**
5. Stock you intend to keep long-term: **Cisco**
6. Favorite sport you participate in: **Golf**
7. Favorite age you've been (so far): **21**
8. Most interesting decade of the 20th century: **1990s**
9. Favorite comic strip of all time: **"Dilbert"**
10. Coke or Pepsi?: **Coke**
11. Favorite film: **"Star Wars"**
12. Favorite car: **Ford Mustang**
13. Favorite daily newspaper: **The New York Times**
14. Person you'd most like to meet: **Jesus**
15. Favorite Web site: **Yahoo.com**
16. Favorite restaurant: **Outback Steakhouse**
17. Greatest invention/discovery of all time: **Electricity**
18. Favorite sports hero (living or dead): **Michael Jordan**
19. Greatest city in the world: **New York**
20. Funniest TV sitcom of all time: **"M*A*S*H"**
21. Favorite radio program: **"The Howard Stern Show"**
22. Most important event of the 20th century: **World War II**



23. Favorite junk food: **Hamburgers/cheeseburgers**
24. Place you'd like to be spending New Year's Eve: **Home**
25. Place you will be spending New Year's Eve: **Home**
26. Talent you wish you had: **Ability to play a musical instrument**
27. Favorite books of all time: **J.R.R. Tolkien's The Hobbit and Lord of the Rings**
28. Favorite after-dinner activity: **Watching TV**
29. Our greatest president: **Abraham Lincoln**
30. Cats or dogs?: **Dogs**

31. Greatest TV cartoon character of all time: **Bugs Bunny**
32. Favorite computer game: **"Doom"**
33. Favorite movie actor of all time: **Harrison Ford**
34. Favorite movie actress of all time: **Meg Ryan**
35. Hamburgers or hot dogs?: **Hamburgers**
36. Favorite nontechnical magazine: **Playboy**
37. Favorite singer or group of all time: **The Beatles**
38. Favorite network tool: **Ping**
39. Most brilliant mind of the 20th century: **Albert Einstein**
40. Favorite vegetable: **Corn**
41. Go gray/bald gracefully or dye/supplement?: **Go gray/bald gracefully**
42. "Star Trek" or "Star Wars"?: **"Star Wars"**
43. Favorite high-tech personality: **Bill Gates**
44. Favorite show on TV today: **"The X-Files"**
45. Favorite sandwich: **Reuben**
46. Favorite goofing-off activity at work: **Surfing the Web**
47. Favorite airport where you wouldn't mind having a two-hour layover: **Atlanta**
48. Favorite dish you cook: **Pasta/spaghetti**
49. Most important event of the next century: **Manned mission to Mars**
50. Most memorable event in your life: **Child's birth**

**FAVORITE GOOFING OFF
ACTIVITY AT WORK:** Traveling
to another campus building to
"check some equipment."



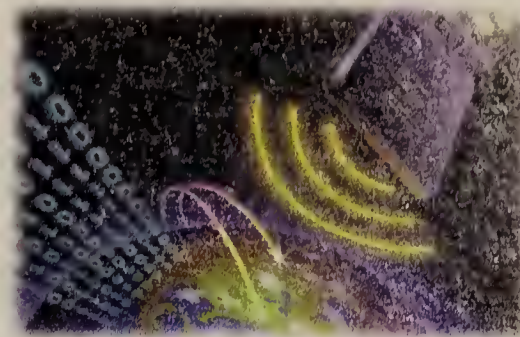
**FAVORITE DISH YOU COOK AT
HOME:** My wife — she gets
steamed.

**WHERE YOU'LL BE THIS NEW
YEAR'S EVE:** Hiding under my
sheets.



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TIME:** Chocolate chip cookies.

Expand your breadth of technical knowledge.



Build your career with an employer of choice at the forefront of the datacentric revolution.

NORTHEAST REGION

OSPE PROJECT MANAGER

You will assist in the outside plant engineering design and construction of a national fiber optic network. This will involve monitoring the daily activities of construction contractors, and participating in construction meetings; updating construction schedules; preparing various weekly reports; participating in the audit of the Construction Inspection Program; and preparing contract documents for design engineering. To qualify, you must have a solid engineering/construction background working on long-distance fiber optic cable projects.

SENIOR DATA ENGINEER

You will maintain data network architecture, national/international Frame Relay deployment; network device testing; capacity planning and pre-sales support as needed. You will research and design new products and services and develop/document engineering standards.

Requirements include 6 years' experience maintaining data networks, as well as a successful track record; excellent management skills; and knowledge of Frame Relay network standards and design concepts.

For immediate consideration, fax/email resume to: Corporate Staffing-ML. Fax: 800-676-3728. Email: maggie_lohkamp@frontiercorp.com

ROCHESTER, NY

COMPUTER AND NETWORK TELECOMMUNICATIONS ENGINEER ANALYST/NETWORK CONSULTANT

Senior position responsible for researching new core network technologies to support a team of Next Generation Design group. Must be heavily experienced in WAN/Telecommunication network design including ATM, VoIP, Frame Relay. Additional experience with Cisco, Bay and 3COM routers; H.323, SS7, MPLS, RTP, NHRP, RSVP, HSRP protocols; T-1, T-3, Fractional T-1, ISDN circuits; SONET is a must.

NETWORK ENGINEERING AND CAPACITY MANAGER

Develop/recommend and maintain NextGen network architecture for products and design initial LAN/backbone as well as future architectural enhancements on a global basis. Lead a group of engineers in setting network standards, test architecture and router maintenance. Must have a proven track record in WAN technology including ATM, VoIP, Frame Relay.

For immediate consideration, fax/email resume to: Corporate Staffing-JM. Fax: 1-800-676-3728. Email: john_mccue@frontiercorp.com

MONROE, NY

OUTSIDE PLANT QUALITY ENGINEERING MANAGER

Directing and guiding the Engineering team of all 4 NY sites in provisioning service to our customers, your specific responsibilities will include interfacing with internal and external customers. Additional responsibilities will include scheduling facility requirements and construction activities with vendors, partners and other utility companies; supervising the conversion of paper records to CADTEL, CAD mapping system and the interface of plant records in DPL; and developing and enhancing a 3+ year Engineering Plan for all 4 NY companies.

Qualified candidates will have a BS in telecommunications or equivalent work experience and strong knowledge of the telecommunications industry; outside plant and central office technologies; Frontier products and services; IISDL, ISDN, Pair Gain devices, and SLC96, SLC series 5 and SLC 2000 technologies. A valid driver's license is necessary. The position requires travel.

DATA NETWORK ENGINEER

Creating and implementing the ADSL network for the NY region, your primary responsibilities will include assisting in the installation and maintenance of Dial up Modems. Key responsibilities will include interfacing for VOIP applications; providing sales support of the Poughkeepsie Lata/Worchester county data opportunities with Lata 133 CLEDC implementations; supporting Network design and Customer Product sets for the Lata 133 fiber distribution rings; and implementing and designing CO LAN for FCNY/SL.

Ideal candidates will have 3+ years of data networking or design experience and a strong background in CISCO routers, TCP/IP, Frame Relay, PPP, SNMP, and Radius. Working knowledge for private and public data networks, LAN/WAN and data test equipment is essential. Some travel is required.

For immediate consideration, fax/email resume to: Corporate Staffing-HM. Email: heather_may@frontiercorp.com Fax: 1-800-676-3728.

NEW YORK CITY & HERNDON, VA NETWORK TECHNICIANS

Background must include familiarity with T-1's and DNS, as well as knowledge of public and private IP routing. The ability to perform pings checks and trace routes is essential.

For immediate consideration, fax/email resume, indicating desired location, to: Corporate Staffing-JM. Fax: 1-800-676-3728. Email: john_mccue@frontiercorp.com

NATIONWIDE

CENTRAL OFFICE TECHNICIANS

Ideal candidates will have experience with DMS 100/250/500, DEC 600E, or similar switch experience and/or extensive telephony knowledge; circuit installation; DS0, DS1 and DS3 acceptance testing; DACS equipment and echo cancelers is desirable.

COMMUNICATION TECHNICIANS

Position requires good working knowledge of transmission principles, electronics, test equipment, and trouble analysis techniques; the ability to test, maintain, and in some situations install all transmission systems, multiplexors, and related peripheral equipment. Additional responsibilities will require the testing and maintaining of DE1, DS1C, DS2 and DS3 transmission systems, OC-48 SONET electronic equipment, microwave radio systems, and video multiplexor equipment. A company car will be provided.

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PHOENIX, AZ

SR. OPERATIONS ENGINEER

Candidate would take responsibility for and oversee all aspects of the entire Frontier GlobalCenter IP network during a specific assigned shift. Applicant must have strong background in IP networking with an operational emphasis. Prior experience with several of the following is essential: UNIX, IP, routing, DNS, management of IP address allocation, knowledge of RFCs and the RFC process, knowledge of BGP, familiarity with SONET, transmission equipment, telephony, termination gear including DS-1 and DS-3 physical media, ethernet and ethernet switches as well as other equipment used in telco central offices or ISPs.

PRODUCT ENGINEER

The Product Engineer develops required infrastructure within Network Operations to support new products in development; interface with product marketing to construct required business cases; design and document the support process flows, network management tools, training and documentation; design and implement metrics to quantify service quality; develop support process flows, trains staff and interfaces with other departments; models product performance and conducts business case analysis and development.

DEDICATED PROVISIONING COORDINATOR

Project manages the end-to-end implementation of local and long distance services for Frontier's Dedicated customer base nationwide. Processes and provisions orders for Centrex Service, Frame Relay, Dedicated 800 Service, ISDN, Internet Service, Voice and PrivateLine, Multi-drop Networks, DSO/DS1/DS3 Service, facilities-based CLEC Service and all future Dedicated products. Performs activities necessary to install, disconnect and maintain customers' dedicated services. Reviews ASRs, tracks receipt of site surveys, pricing, credit approval and critical dates required for timely service activation.

COMMERCIAL PRODUCTS REPAIR CENTER TECHNICIANS

Candidates will be responsible for handling incoming calls and resolving or escalating customer troubles. Position requires basic knowledge of telecommunications systems to include routers, hubs & switches, terminal servers, CSU/DSUs, multiplexers, modems, web servers, proxy servers, and load balancing devices. Must also have knowledge of Unix, TCP/IP, routing protocols and PC hardware systems. Position requires ability to work shifts including evenings, weekends and holidays with some on-call necessary.

For immediate consideration, fax/email resume to Frontier Globalcenter at: Email: thomas_buffington@frontiercorp.com. Fax: (602) 416-6111.



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While the marketing departments of those other networking vendors are busy spinning stories about how they'll be able to give you what you're looking for *someday* in the future, Foundry Networks is telling it like it is *now*, because only Foundry Networks delivers 64-ports of non-blocked, full line rate, wire-speed switched and routed Gigabit Ethernet. And Foundry Networks is the only company that offers a full complement of Layer 2/3 and Layer 4-7 switching, routing, and server load balancing products today!

We are looking for a few, exceptional candidates to join our team as Layer 2/3 and Layer 4 Product Marketing Managers. If you're ready to connect with a hot and exciting company on the leading edge of technology who sells architecture and not markitecture, please see our website at www.foundrynetworks.com/marketing.html for a complete job description, or submit your resume directly to jobs@foundrynetworks.com and reference this job ad in your cover letter.

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As one of the premier providers of internetwork consulting east of the Mississippi, RPM Consulting bases much of its success on hiring the best people and then giving them the training and employment opportunities to become even better.

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Columbia, MD 21045 Attn: NW
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NT Kernel Engineers

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UNIX & NT SQA Engineers

BOSTON, MA & TAKOMA PARK, MD
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Client Server SW Developer (NT & C++)
E-Commerce Programmer (JAVA & C++)
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COM/DCOM Developers
GUI Developers (JAVA & C++)
UNIX & NT SQA Engineers (System Level)

RALEIGH DURHAM
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QA Engineers (NT, UNIX, Perl)
Technical Writer (FrameMaker & RoboHelp)

SAN LOUIS OBISPO
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NT GUI Developers (C++)

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Sr. NT Systems Analysts

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NT Systems Support Specialists
Automated Backup Support Reps
(UNIX & NT)

INFORMATION SYSTEMS

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Director of Applications Dev
Director of Operations
Sr. LAN/WAN Architect

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Oracle DBA
NT Helpdesk support

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OEM Marketing Managers
Beta Program Managers

ROSEVILLE, MN & ORLANDO, FL
NT & UNIX Product Mktg. Managers
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(All roles require Sales or SE experience with Storage/Enterprise Management SW products)

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Responsibilities include:

- Administer network of 100+ Sun UNIX workstation and servers.
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- Solaris to NT Connectivity using PC-NFS and Exceed.

Requirements:

- Solaris/UNIX background. Knowledge of: NIS+, NFS, A5000 Disk Arrays, Disk Suite, Openwindows, PC-NFS, Exceed, Perl and SQL.
- 2 to 3 years of hands-on Solaris experience.
- Exposure to networking, NT and financial trading systems would be assets.

NT Administrator

Email: leaw@ttmc.com

Fax: (441) 229-314

Responsibilities include:

- Maintain/administer approximately 200 PC's in multiple NT domains within a WINS configuration.
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- Maintain/administer 4 Microsoft Hydra Terminal Servers.
- Maintain/administer a closed Internet domain, including PDC, SDC, Firewall and NT clients using roaming profiles.
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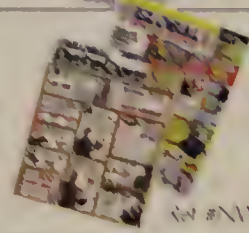
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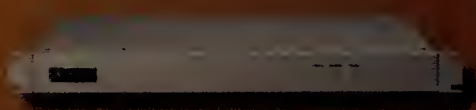
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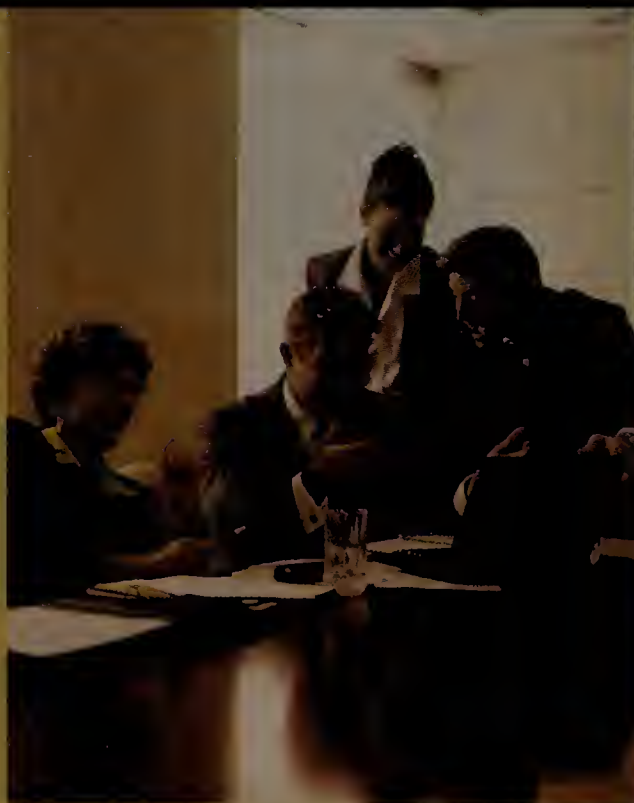
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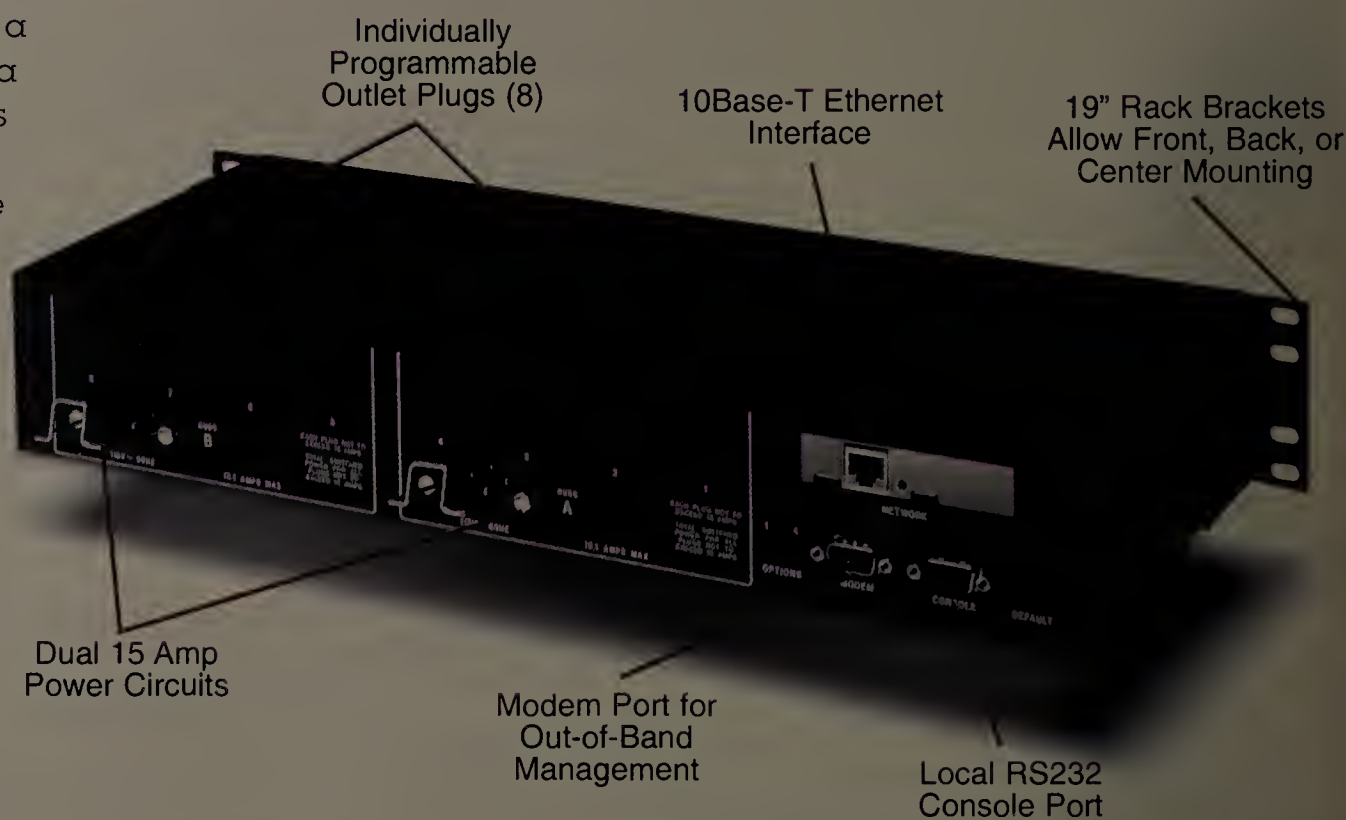


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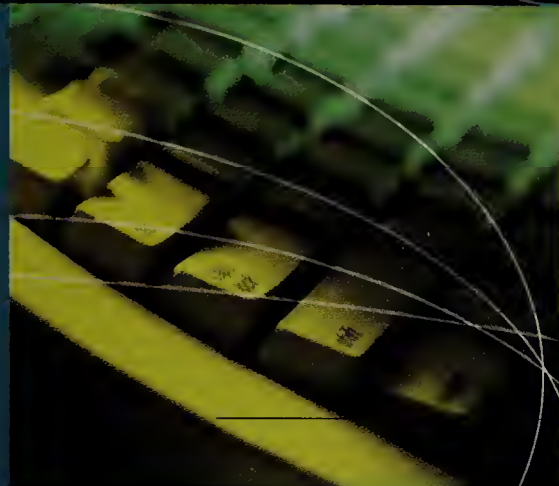
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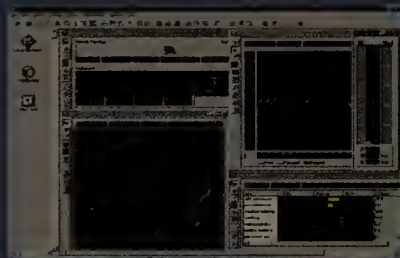
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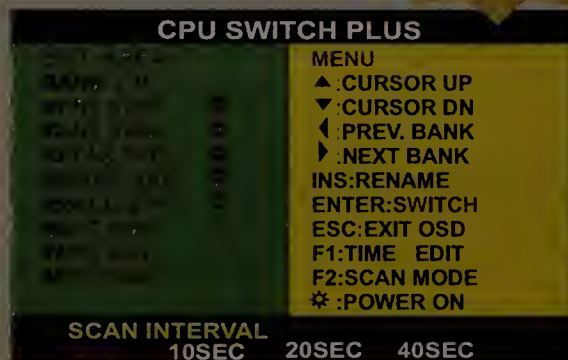
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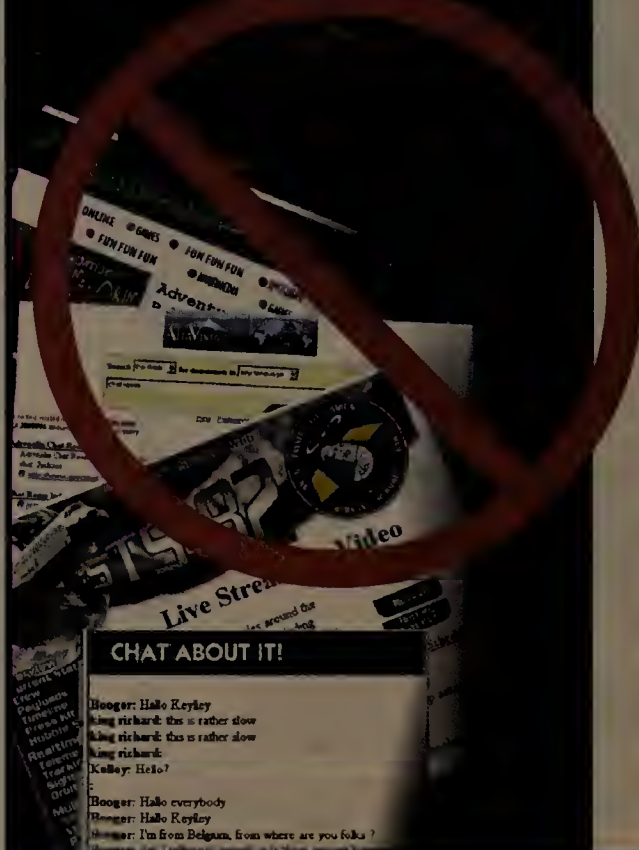
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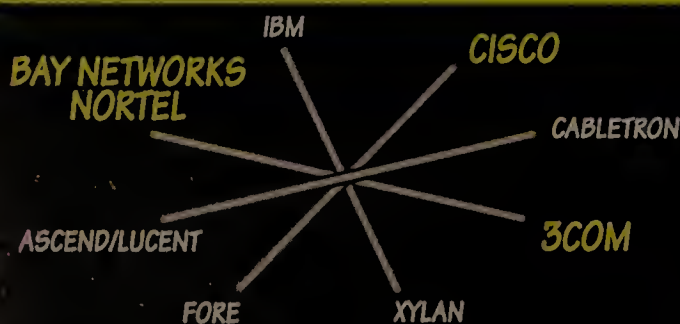
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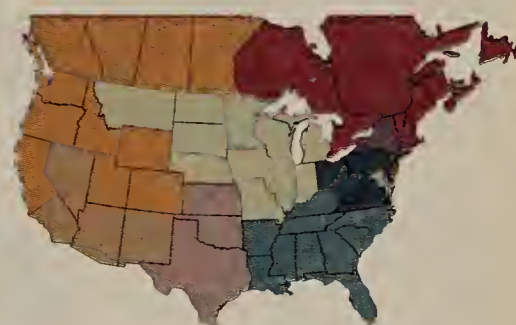
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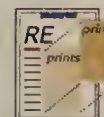


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Qwest beats out Global Crossing for US West

Now Qwest must fight for regulatory approval and figure out how to deal with US West's long-distance restrictions.

BY DAVID ROHDE

DENVER — Qwest last week got in a long line of merger-approval applicants at the Federal Communications Commission, after beating rival bidder Global Crossing for regional Bell operating company US West.

Not only may Qwest and US West have a long wait for merger approval, the companies have a particularly thorny problem to work out with the FCC. The fact that US West does not have the

long-distance authority in the next year, considering it has not yet even applied to the FCC for long-distance in any of its 14 states under the Telecommunications Act of 1996. Plus, the FCC has taken a hard line against letting RBOCs sneak around this restriction via mergers or other deals with long-distance carriers.

Qwest beat out Global Crossing for US West by agreeing to pay \$69 per share, or about \$35 billion, for US West's stock. The US

party take over the customer sites in US West territory if necessary — but the third party would have to retain platforms such as Qwest's Ascend-based frame/ATM network, Cisco-based IP network and Nortel-based circuit-switched network. That way

users wouldn't have to actually migrate their Qwest network ports to a new platform, even though they would technically be dealing with a different carrier for these western states.

"This is a humongous quagmire," says Berge Ayvazian,

executive vice president of The Yankee Group in Boston. Ayvazian suggests Qwest may try to get its European partner, the Dutch phone company KPN, to obtain a U.S. telecom license and then take over Qwest's operations in the US West territory. ■

A potential powerhouse

Qwest and US West bring many compatible assets to the table in their proposed merger deal.

Company: Key assets:

- | | |
|----------------|--|
| US West | <ul style="list-style-type: none"> • PCS: Offers PCS service to 300,000 customers in the West and Midwest. • DSL: Has deployed the service in 40 cities to central offices serving 5.5 million customer households. • Long-distance: Provides long-distance service to 14 states. • Fiber optics: Spans 18,500 miles with its U.S. fiber network. Qwest also has undersea cables that connect the U.S. and Asia. |
| Qwest | <ul style="list-style-type: none"> • High-speed Internet access: Has three high-speed CyberCenter Web hosting facilities in the U.S., with several more under construction. • International expansion: Is working with Dutch telecom company KPN to build an 8,100 mile, IP-based, fiber network in Europe that will link to Qwest's current U.S. network. |

authority to carry long-distance traffic may force Qwest to sell its long-distance voice and data operations in US West's territory when the merger closes. That could mean users would face the typical headaches of dealing with two merging companies' platforms, as well as conceivably having some of their traffic shunted off to yet a third carrier.

Qwest officials vow they would not wait until US West gains long-distance approval before closing the merger. In fact, they claim they will attempt to move up in line at the FCC, arguing that their merger does not raise the same anticompetitive concerns as the pending SBC/Ameritech and Bell Atlantic/GTE deals.

US West is unlikely to get

West board switched its choice from rival bidder Global Crossing to Qwest after Qwest sweetened its offer and agreed to let US West control half the board seats in the combined company. US West had also come under community pressure to strike a deal with its Denver neighbor, Qwest, rather than sell out to Global Crossing, which is based in Bermuda.

After winning the bidding war, Qwest CEO Joe Nacchio and US West CEO Solomon Trujillo flew to Washington, D.C., lobbying for merger approval with FCC Chairman William Kennard and other agency officials.

Reliable sources told *Network World* that the two CEOs reportedly broached the idea of letting a third

HSTR,
continued from page 7

says the market won't support the move.

Too little, too late

"They should have had this a long time ago," says Carl Brandt, a network administrator at Louisiana State University at Baton Rouge. A token-ring advocate, Brandt says he doesn't know if he would buy HSTR products today. The work done to roll out 100M bit/sec token ring "wasn't counterproductive, but it's an also-ran."

Brandt says that when Fast Ethernet came out "it basically signed the premature death warrant for token ring." Brandt's network has about 9,000 nodes; about 1,000 of those are token ring. The backbone is mixed Ethernet and ATM, and supports a main-frame running student records and back-office applications.

His comment is echoed by a source close to the HSTRA who requested anonymity. "End users failed to rally around HSTR, and the token-ring vendors are basically giving up," the source says.

Sources also say the alliance members took too long to get up and running with products, so the migration to 100M bit/sec Ethernet became unstoppable.

The only way for token ring to compete for the hearts, minds and wallets of Fast Ethernet users is for vendors to make a real commitment to gigabit token ring, the sources say. However, IBM and Olicom are more interested in offering a migration to Ethernet than either pure HSTR or gigabit token ring, they say. There are not enough customers to make the investment in HSTR

worthwhile, they add.

Indeed, it is interesting the way IBM, the largest token-ring vendor and the one most closely associated with the technology, has backpeddled. IBM had originally intended to roll out 100M bit/sec token-ring switches, but recognizing a sea change in the network marketplace, decided not to. Instead, the company began to concentrate on ATM, Ethernet and 4/16M bit/sec token-ring and mixed Ethernet/token-ring products. However, IBM says it has prototypes of high-speed token-ring switches, and if the customer outcry were loud enough, it could deliver this gear.

Will the alliance continue?

In addition, the HSTRA continues to ratify various token-ring specifications, says Dave Olechovsky, an IBM spokesman and outgoing president of the group. The group achieved its goal of devising a specification within a year's time, which was faster than any other standard-setting effort, he says.

IBM says the alliance will still exist and possibly work

on a gigabit token-ring specification next. But, then again, maybe not. "We don't expect much more from the alliance," says Jorgen Hog, a vice president at Olicom.

HSTR is doing well for a relatively new technology, says Simon Drennan, a marketing manager at Madge. Sales of 100M bit/sec token ring jumped from 2,200 ports in the first quarter to 3,100 in the second quarter. The company is working on gigabit token-ring technology, he says.

As for IBM, Olechovsky says the company's customers have decided they want to run ATM and 10/100/1000 Ethernet on the backbone, while keeping some token ring for the desktops. He says token-ring sales continue to be brisk.

While the tardiness of HSTR has led to "irreparable" damage to the token-ring camp, network manager Brandt says that it doesn't mean token ring is going to fade away immediately. With or without HSTR, he still plans to keep what token ring he has "for the foreseeable future." ■

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Anritsu switches offer Layer 3 punch

Ethernet-over-SONET devices provide high-speed campus connectivity.

BY JIM DUFFY

MORGAN HILL, CALIF. — With its new Layer 3 switches boasting a speed twice that of Gigabit Ethernet, Anritsu believes it has far surpassed the offerings of competitors looking to outfit campus metropolitan area networks.

The company last week announced its line of MultiFlow 5000 switches. What makes these switches different from the scores of other Layer 3 switches on the market is their ability to forward Ethernet frames at OC-48, or 2.5G bit/sec, rates over SONET-based fiber. This is more than twice the speed of Gigabit Ethernet.

Anritsu's MultiFlow 5000s can also extend Ethernet to 50 kilometers over these SONET links, which is 10 times the maximum distance of Gigabit Ethernet over single-mode fiber.

That's not to say Anritsu is excluding Gigabit Ethernet from the MultiFlow 5000 line-up; the new switches will also scale from two to 16 Gigabit Ethernet ports, Anritsu says.

The ability to support standard-sized Ethernet frames over OC-48 SONET links is an innovation Anritsu calls OC-48 Network Extension (ONE) technology.

ONE, coupled with OC-3 ATM and V.35 T-1 WAN interfaces, gives MultiFlow 5000 users a more cost-effective, higher-performance alternative to software-based routers for enterprise campus connectivity, Anritsu says.

Market leaders Cisco, 3Com, Cabletron and Nortel Networks are also supporting or have plans to support WAN interfaces on their Layer 3 offerings. But Anritsu may be the first to support Ethernet at OC-48 rates.

"[Anritsu] really took a leap there," says Sam Alunni, president of enterprise research at Sterling Research in Sterling, Mass. "This idea of actually using OC-48 and going a step further and using SONET" is an interesting technology.

It remains to be seen, though, if competitors will follow suit, given that other ven-

dors are already offering IP packet-over-SONET capabilities, Alunni says.

The MultiFlow switches also interface to metro and long-

WDM on their high-end backbone switches.

Two chassis-based units and two rack-mountable stand-alone units comprise the

Ethernet or 128 Fast Ethernet ports, respectively.

Chassis units offer hardware redundancy, with additional slots reserved for redun-

One of the stand-alone units sports 32 Fast Ethernet and two Gigabit Ethernet fixed ports, plus an expansion slot for additional Fast Ethernet or WAN interfaces. WAN expansion modules for the stand-alone units include a single OC-3 or two T-1s.

The other stand-alone device features 24 Fast Ethernet and two Gigabit Ethernet ports and no expansion slot.

The MultiFlow 5000s forward traffic at wire speed based on Layer 2, 3 and 4 information, such as MAC addresses, IP addresses and TCP/UDP port numbers. They also provide load balancing, filtering and routing of IPX and AppleTalk, as well as IP.

Routing protocols include RIP and OSPF, plus standard multicasting protocols.

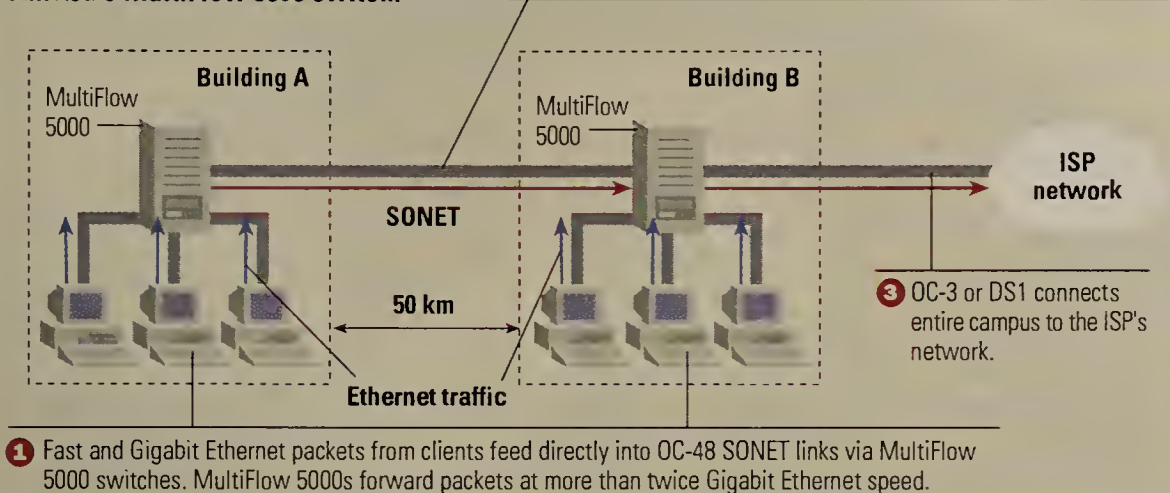
The switches support four levels of traffic priority, and feature the 802.1p and Differentiated Services standards and Weighted Fair Queuing algorithm for quality of service.

The switches are priced from \$499 to \$599 per Fast Ethernet port, and from \$3,992 to \$4,789 per Gigabit Ethernet port. They will be available in September.

Anritsu: www.global.anritsu.com/products/infosys/mf5000spec.html

Composing a SONET

An enterprise campus application of Anritsu's MultiFlow 5000 switch.



haul wave division multiplexing (WDM) equipment, which will let users link enterprise facilities across the country. Nortel and 3Com have announced plans to support

MultiFlow 5000 line.

The two chassis-based units feature four- and eight-slot enclosures housing eight Gigabit Ethernet or 64 Fast Ethernet ports; or 16 Gigabit

Management and switching modules, power supplies and cooling fans. WAN modules for the chassis offerings support two ATM OC-3 ports or four T-1 ports.

Cisco delivers Novell directory features

Management software uses NDS to set network policy and access privileges.

BY JIM DUFFY

SAN JOSE — Cisco is making good on a promise to acknowledge the vast installed base of Novell directory users by unveiling a new version of management software that permits network access based on user identification.

Announced last week, Cisco's User Registration Tool (URT) Version 1.2 lets Novell Directory Services (NDS) and Microsoft Windows NT customers assign user names defined within their directories to network access policy and privileges. URT then uses these directory associations to more easily keep track of users.

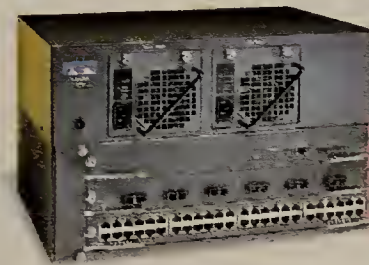
Until now, Cisco has essentially paid lip service to NDS

users with pledges to make CiscoAssure policy-based hardware and software products interoperable with NDS (NW, Nov. 18, 1998).

Cisco's promises were in response to NDS users' concerns that they would be left out in the cold by Cisco's plans to base CiscoAssure offerings on Microsoft's Active Directory (NW, Sept. 7, 1998). Active Directory will ship next year with Windows 2000.

"We were worried that they would not be offering NDS support," says Lisa Laing, senior network analyst at McGill University in Montreal. "We have some islands of NT, but we have about 25,000 users in our NDS tree. When we look at products, NDS integration is very important."

With URT 1.2, mobility ser-



The latest release of Cisco's URT extends dynamic switch port configuration to all of Cisco's switches, including the newer Catalyst 4000 (shown above) and 6000 series, for networks running Novell's NDS.

vices are available across the entire Catalyst switch product line, including the Catalyst 6000, 6500, 5000, 5500, 4000, 2900XL series and the Catalyst 1900/2820, Cisco says. URT configures roaming users to Catalyst-based switched networks by the detection of the

end host's logon name, location within the network and privileges assigned within the URT policy server.

Identification configurations are automatically downloaded from the policy server to the switch, Cisco says.

Laing says the NDS integration in her beta release of URT 1.2 works well, but it's far from a comprehensive offering. Cisco needs to foster tighter integration with NDS across its entire router and management software portfolio, she says.

"We're looking for more," she says. "We've been running NDS for years, and I always feel we're the second-class citizens" to Active Directory.

URT Version 1.2 is available now. It costs \$9,995.

Cisco: www.cisco.com

Ethics and acceptable behavior

"We are aware of your request not to receive e-mail from Music Boulevard and respect it. However, because you are a valued customer, we wanted to take a moment to let you know that Music Boulevard and CDNow are now one company, with a brand-new store — CDNow."

— Remarkably dumb pitch received by "Backspin" reader Matthew Steinhoff.

I just received a dozen copies of a cheesy e-mail pitch for a supposedly pheromone-based perfume. The messages told me I had a gift certificate for \$20 that I could use to purchase the product.

I was annoyed to receive so many spam messages, and I decided to research the vendor. Much to my surprise, the miscreant apparently has an office in Santa Barbara, Calif., a few miles from me. Its domain no longer has an associated Web

server, and the telephone number in its WHOIS record belongs to a very pleasant gentleman who has nothing to do with the spammers and could happily live without the calls he receives for the nonexistent domain owner.

I say nonexistent because there's no trace of the domain contact's name or of any other names associated with the company. Even the online order form doesn't state the company's name and details. This company does not appear to be legitimate. If anyone knows anything about a company operating as The Body Temple, please let me know — I plan to visit it soon.

But what occurs to me is that there is a curious problem here: Where do we draw the line? What is acceptable in unsolicited mailings? This is not a new question from the consumer's viewpoint, but it is an increasingly important one for vendors to address.

Certainly a dozen copies of a

bogus offer from an anonymous company addressed to a slew of random recipients is way beyond the pale, but what about the CDNow pitch received by Matthew Steinhoff?

I think CDNow also crossed the line. Steinhoff had told Music Boulevard clearly (at least twice) that he didn't want to hear from it again. But not only did the company fail to remove him from its database, it handed him to CDNow. And CDNow could have handled the pitch with far more finesse than it did. Had CDNow said it had acquired Music Boulevard's records and wanted to assure him it was serious about respecting his privacy and would dispose of his data, I'm certain he would have been gratified, although he might have been annoyed that his wishes had been ignored.

But CDNow went over a boundary by not only showing that it had his data, but that it was also willing to use it to pitch him. And on top of that, it had the nerve to say it respected his wishes. Amazing! I wonder who was responsible for this breach of ethics? I would doubt it was an IS professional.

Now this is a situation in which many companies, yours included, may well find themselves. Over the next few months through acquisitions and mergers, you might well discover caches of old customer data and find that there are records flagged to show that the customers had opted-out of some program. What should you, the IS professional, do?

Simple, make sure that the rest of the company understands that opt-out customers have really opted-out. By getting involved you may be in danger of picking a fight with an 800-pound political gorilla, but you may also be saving your company's reputation and image.

When it comes to respecting privacy, IS professionals must educate the rest of the company about the ethics of the 'Net. If you don't, your companies will undoubtedly run full-tilt into trouble.

Ethical issues to nwcolumn@gibbs.com



MARK
GIBBS

The latest on the
Internet/intranet industry

Space.com will be a wonderful resource for children, grown-ups and perhaps even businesses once the 'Net start-up's Web site becomes fully populated with all you ever wanted to know about the final frontier. Whether "everything space" is the right stuff to launch a business, though, certainly remains an open question.

But who cares about such earthly concerns as profit potential? Last week's debut of Space.com gave Buzz an opportunity to interview an honest-to-goodness astronaut, **Sally Ride**, who twice flew on the space shuttle and is now part of the crew trying to get this venture off the ground. (Not since an early 1990s one-on-one with football legend Johnny Unitas has your curmudgeonly correspondent been so star-struck.)

Space.com was founded a few months back by former CNN newsman **Lou Dobbs**, who ditched a successful TV gig to build this business around his lifelong passion. While still in the formative stage, the site promises to provide multimedia coverage of NASA missions, scientific breakthroughs, commercial aeronautics and historical information, as well as opportunities to interact with fellow space buffs. Oh, and you too might get to chat with an astronaut, albeit online.

Sounds cool. But does it sound like a business?

Ride insists she needed no convincing after hearing what Dobbs had planned. Ride sent Dobbs an e-mail expressing interest in the project, and he invited her to join the company as a director and content advisor.

"Even though there are a zillion Web sites out there that have something to do with space, space science, space education, space business — including NASA's site — you still have to look around a lot to find even the most straightforward information," Ride says. "I've experienced this in looking for materials for the classes that I teach at [the University of California, San Diego], my students have experienced it and people I know at NASA have experienced it."

Want to know the success rate for a particular satellite launch vehicle or how many women have flown in space? You'll have a hard time finding those answers today, Ride says. Once Space.com fills out its databases, that kind of information will be readily available, she adds.

Backed by venture capital firms **Venrock Associates** and **Graylock**, Space.com initially will depend on advertising for revenue, but the start-up has hopes to conduct business-to-business e-commerce from the site. The start-up's backers see their audience as not only schoolchildren and space buffs, but also professionals whose workdays bring them into the realm of space.

"When you start including the telecommunications companies, the launch vehicle companies, the ground service companies, it's really quite a large community," Ride says.

And they'll find more than straight reporting and dry science at Space.com. There will be fun stuff, too, such as this example of "Today's Space Fact":

"The first liquid-propellant rocket was launched March 16, 1926, by space-travel visionary **Robert Goddard**. Fueled by a mixture of liquid oxygen and gasoline, Goddard's rocket fired 41 feet into the air above his Aunt Effie's cabbage plot in Auburn, Mass."

By the way, Aunt Effie's cabbage plot was planted a well-struck 6-iron shot away from my new home. And a 6-iron, true space buffs know, is what the late **Alan Shepard** used in 1971 when he teed it up at the ultraexclusive Lunar Country Club. (A 6-iron was way too much club, too, given the conditions.)

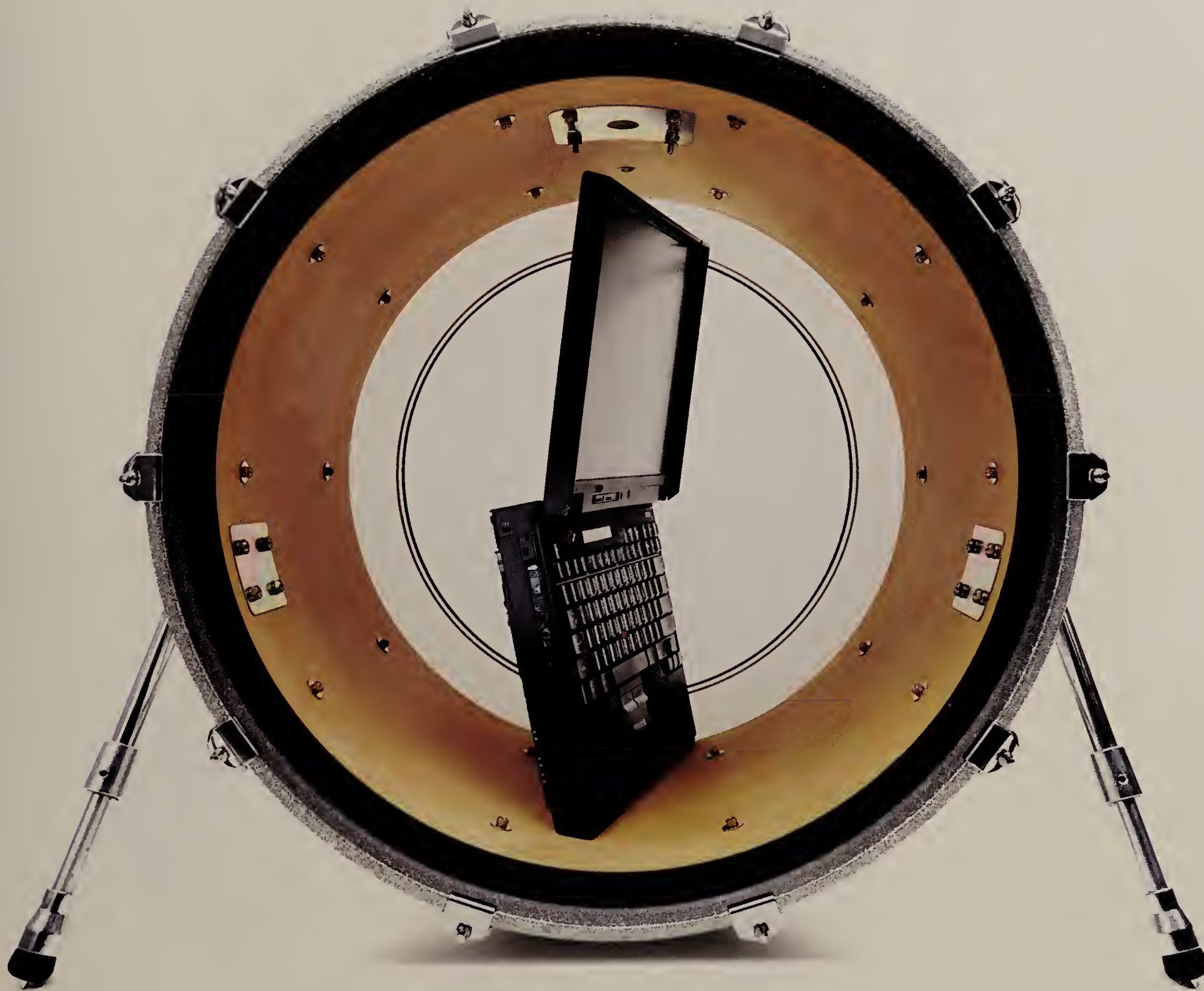
There's also an Area 51 section for the UFO crowd on Space.com. While this sort of "X-Files" fodder may generate traffic, Ride is well aware of the risks, too.

"We want to walk a fine line there and make sure that we keep the credibility of the entire Web site," she says. "But we also don't want to be too serious all the time."

E.T. and others can contact McNamara with their Internet tips at (508) 820-7471 or pmcnamara@nw.com.



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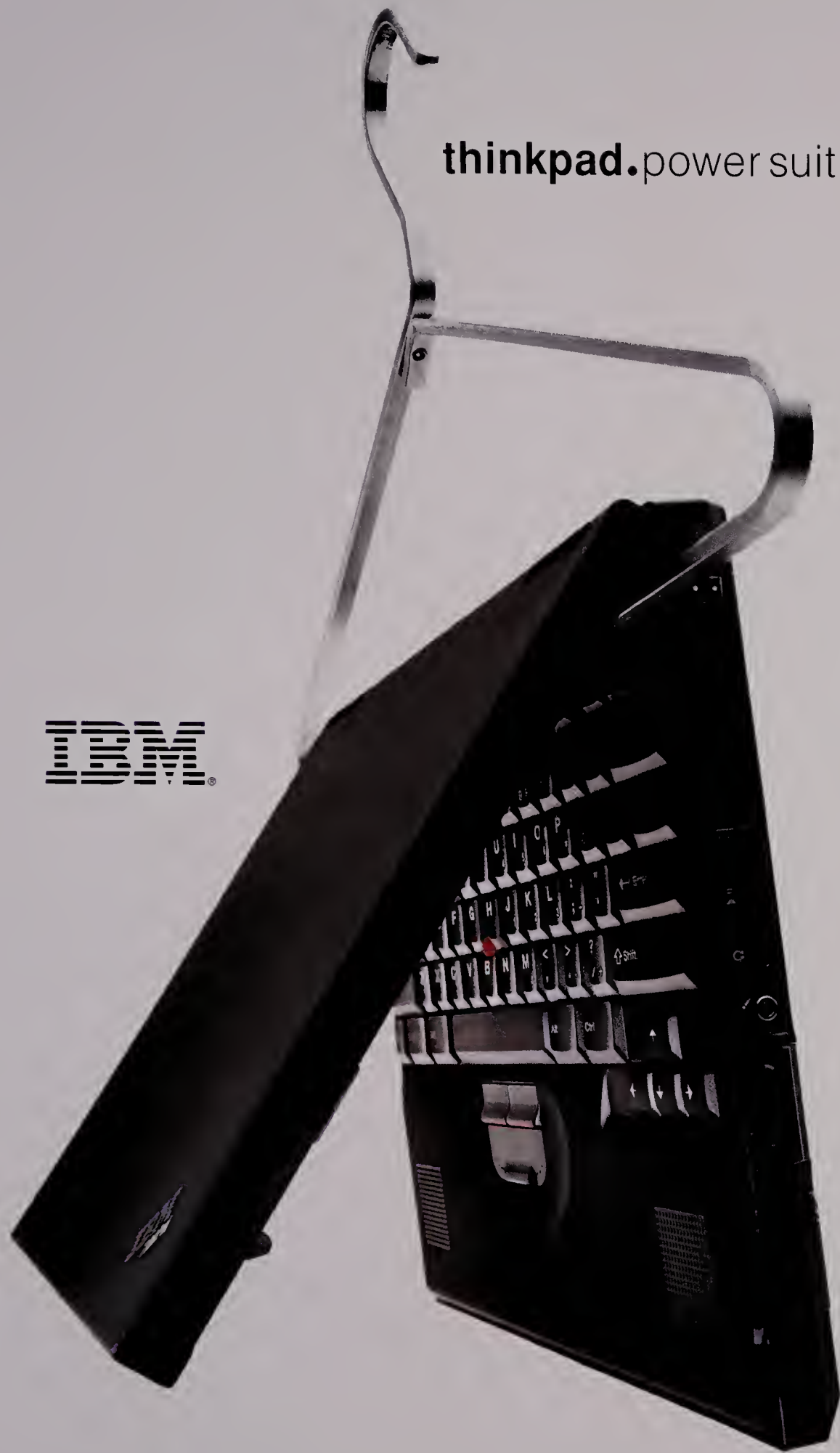
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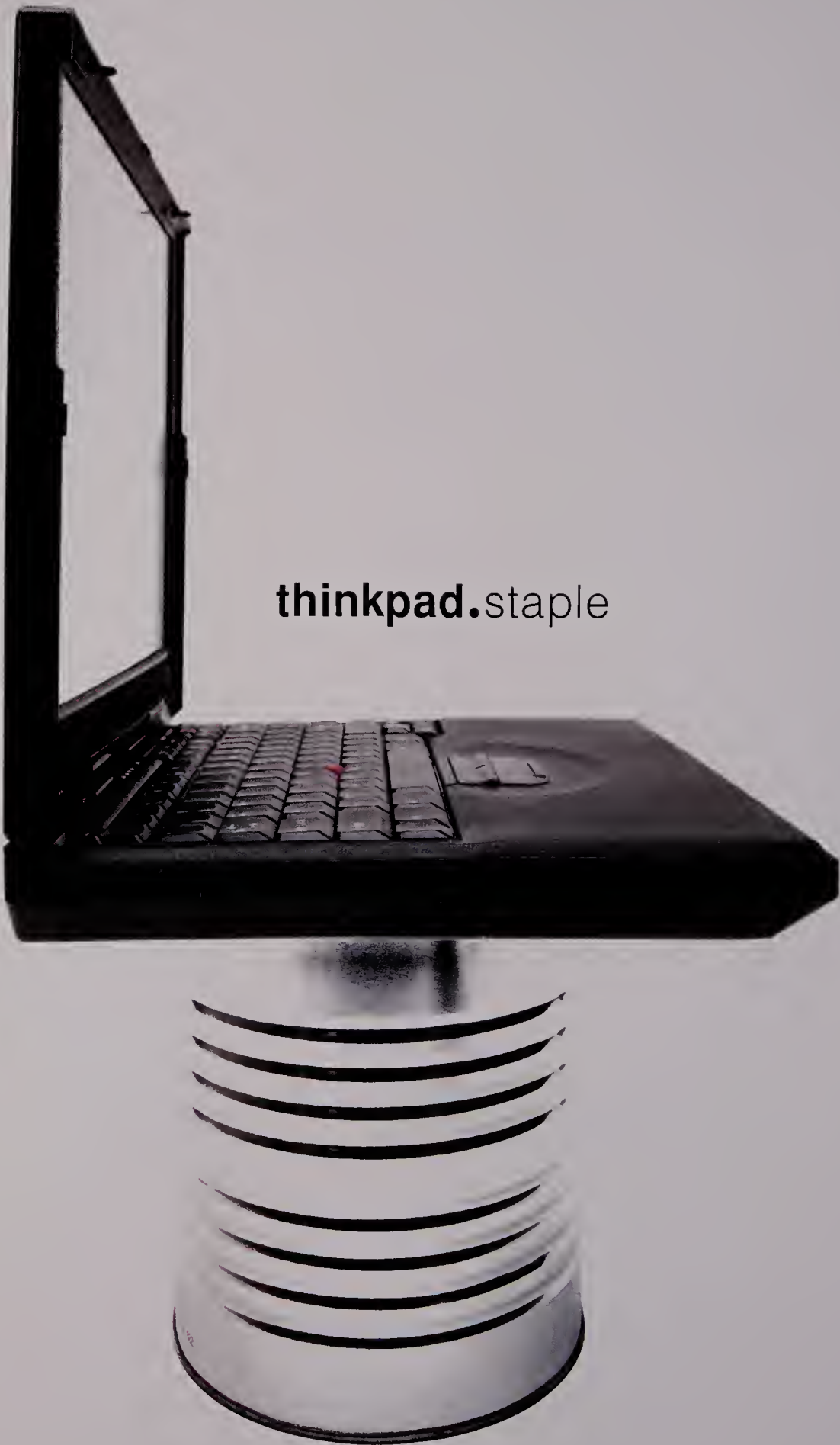
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